

**FACTORS INFLUENCING ICT IMPLEMENTATION IN INCLUSIVE PRIMARY
SCHOOLS IN MANZINI REGION: ESWATINI**

By

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FACTORS INFLUENCING ICT IMPLEMENTATION IN INCLUSIVE PRIMARY SCHOOLS IN MANZINI REGION: ESWATINI

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I further declare that I submitted the dissertation of limited scope to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted the work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.

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Date

DEDICATION

This dissertation is dedicated to Almighty God for giving me the gift of life and my loving children, Nokwanda and Bandile, for their unconditional support. I also dedicate it to all my family members, especially my brother Sthembiso, for always being there for me.

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ABSTRACT

As rapid technological development constantly drives and reshapes the economy, it is vital for learners and teachers to be highly proficient in the use of Information and Communication Technology (ICT). The data collected revealed that the barriers to ICT integration can be viewed as deprivation to both teachers and learners, especially those with diverse disabilities and learning difficulties. ICT implementation is therefore more than just change driven by technology. It is an opportunity to assist everyone, including people from all income groups, policy-makers and leaders to support converging technologies to create a more inclusive and humane future.

The research was designed as a case study. Face-to-face interviews were conducted, lesson observations were undertaken and qualitative questionnaires were administered as methods of data collection. The research population included principals and ICT teachers in the Manzini Region. The sample was made up of two principals and 13 teachers. The data was transcribed and presented as raw data and thereafter analysed thematically. The data collected was analysed qualitatively.

The findings of the study were that the factors influencing ICT implementation in inclusive primary schools in Eswatini included a lack of skills and knowledge from teachers; the lack of teaching and learning time allocated to ICT; insufficient teaching and learning materials; a lack of motivation and an insufficient number of teachers. Other factors included the lack of support and collaboration from principals and the Government of Eswatini.

In view of the above factors, some recommendations were made, namely, that the Ministry of Education should reintroduce ICT in all inclusive primary schools. The schools that offer ICT should consider increasing the time allocated for ICT and enhance Continuous Professional Development (CPD) for ICT teachers. They should also provide for learners with diverse disabilities and learning difficulties a variety of teaching materials such as assistive devices to enhance teaching and learning.

Key words: *Accommodate; Assistive devices; Barriers to learning; Curriculum; Diverse disabilities; Factors influencing ICT; ICT implementation; ICT usage; Inclusive education; Inclusive primary schools; learning difficulties; Mainstream schools; Teachers' attitudes; Teaching and learning.*

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Sihloko: **TIMBANGELA LETINEMTSELELA EKUFEZEKISENI KUSETJENTISWA
KWELWATISO NEKUCHUMANA NGETEBUCHWEPHESHE ETIKOLWENI
TEMABANGA LAPHANSI LETIFUNDZA WONKHE WONKHE
LETISESIGODZINI SAKAMANZINI: ESWATINI**

SINIKAMONGO

Njengaloku kutfutfuka ngekushesha kwetebuchwepheshe kuchubeka kucondzisa futsi kwakha kabusha nemnotfo, kumcoka kutsi bothishela nebafundzi babe nelikhono leliphakeme lekusebentisa Lwatiso neKuchumana ngeTebuchwepheshe (i-ICT). Ledatha legcogciwe ivete kutsi tihibe tekuhlanganisa i-ICT tingabukwa njengekuncisha bothishela nebafundzi, ikakhulu kubafundzi labaphila nekukhubateka lokwehlukahlukene kanye nebulukhuni ekufundzeni. Kufezekiswa kwekusetjentiswa kwe-ICT ngako-ke kungetulu kwekutsi nje kuchutjwa ingucuko yetebuchwepheshe, kodwa kulitfuba lekusita wonkhe umntfu, lokufaka ekhatsi bantfu lababuya kuwo onkhe emacembu etemnotfo, labo lababhala tinchubomgmo nebaholi, kutsi basekele kuhlanganiswa kwetebuchwepheshe kute kudaleke likusasa lelifaka lonkhe luntfu.

Lolucwaningo luhlelwe njengesifundvolucwaningo lwesehlakalo. Kubanjwe emanthaviyu buso nebuso, kwentiwa sifundvo sekucaphela kanye nemaphephambuto elizingasimo njengetindlela tekugcogca idatha. Linanibantfu lalolucwaningo lifaka ekhatsi bothishelanhloko kanye nabothishela labafundzisa i-ICT eSigodzini sakaManzini Eswatini. Lesamphuli yakhiwa bothishelanhloko lababili kanye nabothishela laba-13. Ledatha yabhalwa yetfulwa njengaloko injalo ingakahlutwa kwase kutsi-ke emva kwaloko yahlatiywa ngekwengcikitsi. Ledatha leyagcogcwa yahlatiywa ngekwelizingasimo.

Lokutfolwe ngulesifundvolucwaningo kutsi timbangela letinemtselela ekufezekiseni kusetjentiswa kwe-ICT etikolweni temabanga laphansi letifaka wonkhe wonkhe Eswayini, kufaka ekhatsi kuswelakala kwemakhono nelwati kubothishela; sikhatsi sekufundzisa nekufundza lesinganeli lesiphakelwa kufundziswa kwe-ICT; ticukatsilwati tekufundzisa nekufundza letingakaneli; kubete umdlandla kanye nelinani lelingakaneli labothishela. Lenye imbangela kungabikhona kwekusekelwa nekuhlanganyela lokuvela kubothishelanhloko nakuhulumende weleSwatini.

Ngekubuka letimbangela letingenhla, kwentiwe-ke letincomo letilandzelako: Litiko Letemfundvo kufanele kutsi liphindze letfule i-ICT kuto tonkhe tikolo temabanga laphansi letifundzisa wonkhe wonkhe, tikolo letifundzisa i-ICT kufanele kutsi tikubheke kwengetwa kwesikhatsi sekufundzisa i-ICT kanye nekwenza ncono Kutfutukiswa Ngalokuchubekako Kwebungcweti (i-CPD) kubothishela labafundzisa i-ICT, kantsi futsi letikolo kufanele tinake nebafundzi labaphila nekukhubateka lokwahlukahlukene nebulukhuni bekufundza ngekutsi banikwe ticukatsilwati tekufundzisa letahlukahlukene njengetisetjentiswa tekusita kute kwentiwe ncono kufundzisa nekufundza.

Emagama lamcoka: *Kufaka ekhatsie; Tisetjentiswa tekusita; Tihibe tekufundza; Ikharikhulamu; Kukhubateka lokwahlukahlukene; Timbangela letinemtselela ku-ICT; kufezekisa kusetjentiswa kwe-ICT; Kusetjentiswa kwe-ICT; Imfundvo lefaka wonkhe wonkhe; Tikolo temabanga laphasi letifundzisa wonkhe wonkhe; Bulukhuni ekufundzeni; Tikolo letetayelekile; Tindlela bothishela labatsatsa ngayo tintfo; Kufundzisa nefundza.*

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Setlhogo: **DINTLHA TSE DI SUSUMETSANG TSENYOTIRISONG YA ICT KWA
DIKOLONG TSA PORAEMARI TSE DI AKARETSANG KWA KGAOLONG YA
MANZINI: ESWATINI**

TSHOBOKANYO

Jaaka lebelo la tlhabololo ya thekenoloji le tswela go tsamaisa le go bopa ikonomi sešwa, go botlhokwa gore barutwana le barutabana ba nne le bokgoni jo bo kwa godimo mo tirisong ya Thekenoloji ya Tshedimosetso le Tlhaeletsano (ICT). *Data* e e kokoantsweng e senotse gore dikgoreletsi tsa kgokaganyo ya ICT di ka bonwa e le tlhalelo mo barutabaneng le barutwaneng, bogolo segolo barutwana ba ba nang le bogole jo bo farologaneng le mathata a go ithuta. Ka jalo, tsenyotirisong ya ICT ga se fela diphetogo tse di tsamaisiwang ke thekenoloji; ke tšhono ya go thusa mongwe le mongwe, go akarediwa batho go tswa ka ditlhopheng tsotlhe tsa lotseno, badiradipholisi le baeteledipele, go tshegetsa dithekenoloji tse di kopanang go tlhama isago e e akaretsang e bile e le molemo.

Patlisiso e rulagantswe jaaka thutopatlisiso e e lebelelang kgetsi. Go dirilwe dipotsolotso tsa namana, go nnile le kelotlhoko ya dithuto mme go dirisitswe dipampiripotsoloto tse di lebelelang mabaka jaaka mekgwa ya go kokoanya *data*. Setlhophasegolo sa patlisiso se akareditse bagokgo le barutabana ba ICT kwa Kgaolong ya Manzini kwa Eswatini. Sampole e ne e dirwa ke bagokgo ba le babedi le barutabana ba le 13. *Data* e ne ya gatisiwa mme ya tlhagisiwa e le *data* e e sa fetolwang mme morago ya lokololwa go ya ka meono. *Data* e e kokoantsweng e lokolotswe go ya ka mabaka.

Diphithlelo tsa thutopatlisiso e nnile gore dintlha tse di tlotlhelletsang tsenyotirisong ya ICT mo dikolong tsa poraemari tse di akaretsang kwa Eswatini di akaretsa tlhalelo ya bokgoni le kitso mo ntlheng ya barutabana; nako e e sa lekanang ya go ruta le go ithuta e e rebolelwang ICT; dimatheriale tse di sa lekanang tsa go ruta le go ithuta; tlhalelo ya thotloetso le palo e e sa lekanang ya barutabana. Ntlha e nngwe e nnile tlhalelo ya tshegetso le tirisano mogo go tswa mo bagokong le puso ya Eswatini.

Ka ntlha ya dintlha tse di fa godimo, go dirilwe dikatlenegiso tse di latelang: Lefapha la Thuto le tshwanetse go itsese sešwa ICT mo dikolong tsotlhe tsa poraemari tse di akaretsang, dikolo tse di tlamelang ka ICT di tshwanetse go akanya ka go oketsa nako e e rebolelwang ICT le go tokafatsa Tlhabololo e e Tsweleng pele ya Seporofešenale (CPD) ya barutabana ba ICT, mme dikolo tseno di tshwanetse gape go akanyetsa barutwana ba ba nang le bogole jo bo farologaneng le mathata a go ithuta ka go ba tlamela ka dimatheriale tse di farologaneng tsa go ithuta di tshwana le didiriswa tse di thusang go tokafatsa go ruta le go ithuta.

Mafoko a botlhokwa: Akaretsa; Didiriswa tse di thusang; Dikgoreletsi tsa go ithuta; Kharikhulamo; Bogole jo bo farologaneng; Dintlha tse di tlotlhelletsang ICT; Go tsenngwa tirisong ga ICT; Tiriso ya ICT; Thuto e e karetsang; Dikolo tsa poraemari tse di akaretsang; Mathata a go ithuta; Dikolo tsa tlhalelo; Mekgwa ya barutabana; Go ruta le go ithuta.

Idezetheshini yeZiqu zeMastasi

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Isihloko: **IZIMBANGELA EZINOMTHELELA EKWETHULWENI
KWEZOBUCHWEPHESHE OKUBANDAKANYA IZIKOLE ZAMABANGA APHANSI
KUSIFUNDA SASEMANZINI: ESWATINI**

ISIFINQO

Njengoba intuthuko yezobuchwepheshe esheshayo iqhubeka nokugqugquzela nokwakha kabusha umnotho, kubalulekile ukuthi abafundi nothisha babe nekhono eliphezulu ekusebenziseni Ulwazi Lwezobuchwepheshe Kwezokuxhumana. Imininingwane eqoqiwe iveze ukuthi izithiyo ekuhlanganisweni zoLwazi Lwezobuchwepheshe Kwezokuxhumana zingabhekwa njengokuncishwa amathiba kothisha nabafundi, ikakhulukazi abafundi abanokukhubazeka okuhlukahlukene nobunzima bokufunda. Ukuqaliswa koLwazi Lwezobuchwepheshe Kwezokuxhumana kungaphezu nje koshintsho oluqhutshwa ezobuchwepheshe; kuyithuba lokusiza wonke umuntu, kufaka phakathi abantu abavela kuyo yonke imikhakha yabaholayo, abenza izinqubomgomo kanye nabaholi, ukusekela ubuchwepheshe obuhlanganayo ukudala ikusasa eliyinhlanguanisela futhi elinobuntu.

Ucwaningo lwakhiwe njengesifundo esiwucwaningo lwesigameko. Kwenziwa inhlolekhono noma zingxoxo ubuso nobuso, kwenziwa ukubhekwa kwezifundo futhi kwenziwa nemibuzo esezingeni elifanele njengezindlela zokuqoqa imininingwane. Abantu abafakwe ocwaningweni babandakanya othishanhloko kanye nothisha boLwazi Lwezobuchwepheshe Kwezokuxhumana esifundeni saseManzini eSwatini. Isampula yayenziwe kothishanhloko ababili nothisha abayi-13. Idatha yabhalwa futhi yethulwa

njengedatha engahlungiwe futhi ngemuva kwalokho yahlaziywa ngokulandelana. Imininingwane eqoqiwe yahlaziywa ngokufanele.

Okutholakele kulolu cwaningo ngukuthi izinto ezinomthelela ekusebenzeni koLwazi Lwezobuchwepheshe Kwezokuxhumana ezikoleni zamabanga aphansi ezibandakanya bonke abantu eSwatini zibandakanya ukuntuleka kwamakhono nolwazi kothisha; isikhathi esinganele sokufundisa nokufunda esabelwe uLwazi Lwezobuchwepheshe Kwezokuxhumana izinto zokufundisa nokufunda ezinganele; ukungabi nogqozi kanye nenani elinganele lothisha. Enye yezimbangela ukungabikho kokwesekwa nokusebenzisana kothishanhloko nohulumeni wase-Eswatini.

Ngenxa yalezi zinto ezingenhla, kwenziwa izincomo ezilandelayo: uMnyango Wezemfundo kufanele uphinde ufake uLwazi Lwezobuchwepheshe Kwezokuxhumana kuzo zonke izikole zamabanga aphansi ezibandakanyekayo, izikole ezifundisa uLwazi Lwezobuchwepheshe Kwezokuxhumana kufanele zicabangele ukukhulisa isikhathi sokufundisa esabelwe uLwazi Lwezobuchwepheshe Kwezokuxhumana futhi zithuthukise Ukuthuthukiswa Okuqhubekayo Kwezobuchwepheshe kothisha boLwazi Lwezobuchwepheshe Kwezokuxhumana, futhi lezi zikole kufanele futhi zihlinzeke izitshudeni ezinokukhubazeka okuhlukahlukene nobunzima bokufunda ngendlela yezinhlobonhlobo zezinto zokufundisa ezinjengamathuluzi okusiza ukuthuthukisa ukufundisa nokufunda.

Amagama abalulekile: Hlinzeka; Izinsiza ezisizayo; Izithiyo ekufundeni; Uhlelo lwezifundo; Ukukhubazeka okuhlukahlukene; Izimbangela ezinomthelela kuLwazi Lwezobuchwepheshe Kwezokuxhumana; ukwenziwa koLwazi Lwezobuchwepheshe Kwezokuxhumana; ukusetshenziswa koLwazi Lwezobuchwepheshe Kwezokuxhumana; Imfundo ebandakanya wonke umuntu; Izikole zamabanga aphansi ezibandakanya wonke umuntu; Izingqinamba zokufunda; Izikole ezijwayelekile; Isimo sengqondo sothisha; Ukufundisa nokufunda.

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LIST OF ABBREVIATIONS

ACE - Annual Education Census

AT – Assistive Technologies

BBT- Born Before Technology

CK – Content Knowledge

4IR – Forth Industrial Revolution

ICT- Information and Communication Technology

MoET – Ministry of Education and Training

NGO – Non-Governmental Organisations

PCK- Pedagogy Content Knowledge

PK – Pedagogy Knowledge

SDG – Sustainable Development Goals

TPACK – Technology Pedagogy Content Knowledge

TK – Technology Knowledge

UK – United Kingdom

UPE - Universal Primary Education

WEF – World Economic Forum

CHAPTER 1

1.1 INTRODUCTION AND BACKGROUND

Information and Communication Technology (ICT) devices and networks have a very important role to play for individuals in how they play, live and work, including in formal and informal learning processes. Gunter, Gunter and Shelly (2009) point out that all organised structures in businesses and schools, regardless of their size, are dependent on technology to work effectively and efficiently. ICT tools and devices help people work accurately, faster, and in many instances, succeed in ways that were previously thought of as impossible. The school, therefore, should provide equal opportunities for all learners in order to achieve inclusion (UNESCO, 2015). Edwards, Besio and Tokareva (2006) indicated that there are assistive/adaptive technologies that could be used in schools to enhance the education of learners with diverse disabilities and learning difficulties. These technologies are further described by Koech (2018) as tools, adjustments and alterations implemented to improve learners' capabilities to learn, to communicate, to problem solve or to complete a task using computers, which could furthermore accommodate learners with special needs.

Inclusive ICT improves the quality of life, access, participation and reduces social rejection (UNESCO, 2017). ICT in inclusive education therefore means integrating it in the curriculum to respond to diverse learners' needs (UNESCO, 2015). It is difficult to imagine a future learning environment without ICT usage when considering that most children are being born into a technology-driven society (the digital generation). As the world changes and improves, teachers need to adjust to the use of technological devices to enhance teaching and learning to accommodate those learners with disabilities or those with barriers to learning (UNESCO, 2015; Shan, 2013). Teachers do not have to rely on old strategies to conduct their teaching but their attitudes towards ICT implementation should change to accept and implement new ICT strategies in the classroom. As the 21st century is already in full swing, computer literacy will undoubtedly become a requirement in whatever career path a student chooses. ICT education seeks to provide learners with the foundation to build the necessary skills without which they would effectively be left behind or excluded.

According to a UNESCO (2017) survey conducted in Australia in 2015, learners in that country have a blog for receiving comments and sharing what they have learned through projects.

Similarly, learners in the United States of America, aged 5 to 6 years, created videos that they post on the internet and communicate with other learners all over the world. In China the government is trying to break the barriers to ICT accessibility between rural and urban schools (Lu, Tsai & Wu, 2014). It was ascertained by Steukers (2014) that about 10% of primary schools in Kenya have integrated ICT in their education. UNESCO (2015) revealed that Lesotho has had an ICT Policy since 2005 and a Draft ICT Implementation Plan which states that ICT should be implemented in teaching and learning in primary and secondary schools in three ways, namely, learning about ICT, learning through ICT and learning with ICT. This will enable enhanced ICT usage in the education of learners with diverse disabilities and learning difficulties.

Mweli (2013) argued that in South Africa, it had been over 10 years since Education White Paper 6 (EWP6) (Department of Education [DoE], 2001) was unveiled but many learners with diverse disabilities and learning difficulties are still not able to learn with their peers in mainstream schools. Starcic (2010) posits that ICT has not been incorporated for addressing the needs of learners with special educational needs. This may be because ICT has not been fully appreciated as a learning tool. Most technological tools and devices acquired for mainstream learners do not cater for the capabilities and disabilities of learners with special educational needs.

Teachers, policy-makers, governments, non-governmental organisations (NGOs) and those working in all sectors of education now recognise the importance and value of technology in education (Scherera, Siddiqb, & Tondeur, 2019). Madzima, Dube and Mashwama's (2014) research study found education as a natural platform to equip learners and the whole nation with ICT skills. In order to adjust and conform to technological innovations in education and keep abreast of the world's direction, Eswatini adopted a National Information and Communication Infrastructure (NICI) Policy in 2006. The Government of Eswatini is committed to enhancing the education of all learners despite their disabilities through ICT and the Ministry of ICT therefore developed a Draft ICT Implementation Plan 2012 - 2016. Simelane (2013) however revealed that this draft policy still awaited adoption and implementation by the relevant stakeholders. While benefits are accepted by teachers, the use ICTs is unstructured, haphazard and uneven and not a priority for many schools in the country (Eireann, 2015). In 2013 the Computer Education Trust, government of Eswatini and other partners donated 2600 computers, 20 computers to each of the 130 inclusive primary schools in the country (Simelane, 2013). After receiving the donations, the schools started using

computers without a clear policy guiding them on what to do, how to do it and when to do it. Despite the efforts to provide primary schools with technological tools such as computers, for many schools in the country, ICT devices that could aid teaching and learning are hardly in use. This research, titled ‘Factors Influencing the Implementation of ICT in Inclusive Primary Schools’ was therefore conducted.

1.2 RATIONALE FOR THE STUDY

This study was inspired by my experience as a teacher after I attended a workshop in 2015 on ‘Education and Technology’. In this workshop, ICT was presented as vital sources of information and tools that could be used by teachers and learners to enhance learning in all grades and for learners from all backgrounds and abilities. It was recognised that learners no longer depended solely on teachers and textbooks for information.

ICT literacy is still very limited in Eswatini even though it is relatively easy for learners and teachers to access ICT resources. According to Simelane (2013) and Brummelhuis and Kuiper (2008), teachers in many schools are struggling to understand how to access or use ICT devices for instructional purposes. The Government of Eswatini, concerned NGOs and the Computer Education Trust (CET), have taken the initiative to donate ICT tools to a number of inclusive primary schools, however, they are unused or reported to have been stolen (MoET, 2010).

In the past decade, many researchers investigated ICT usage and implementation in inclusive primary schools around the world. It should be noted that in Eswatini, limited studies are available on ICT in inclusive primary schools and this motivated the present study. In 2007, Isaacs published a paper on ICT education in Eswatini which found that the penetration level of ICT usage was growing reasonably fast and had reached approximately the average of other countries in the Southern African region, but this was still well below international standards. A 2013 research study by Simelane which focused on ICT use in Mathematics and Science revealed that Eswatini has made very little progress towards ICT integration in Science and Mathematics. Mndzebele’s (2013) study focused on challenges faced in the introduction of ICT by schools in developing countries in Africa. Her findings will be discussed further in Section 1.7.4. Not much research has however been carried out to investigate the factors influencing ICT implementation in Eswatini’s inclusive primary schools. This research study will therefore address the fundamental question of the factors influencing ICT implementation to date, what

teachers are doing and what should be done to improve ICT integration in inclusive primary schools so that ICTs can be used to enhance education for all learners.

1.3 SIGNIFICANCE OF THE STUDY

The results and outcome of the study will act as guidelines for specialists in the Ministry of Education and Training (MoET) in Eswatini, the Curriculum Development Centre and schools in order to improve the levels of access and overall quality of ICT in inclusive schools. This study will also help identify some of the factors that hinder the implementation of ICT in inclusive schools and how these barriers could be eliminated. Furthermore, it is hoped that the study will assist teachers to effectively use ICT to enhance and accommodate diversity in teaching/ learning and how learners could be helped to become active participants in learning. It is hoped that the government, NGOs and interested stakeholders may use the research findings to introduce effective measures and formalise ICT implementation in all inclusive primary schools in Eswatini. It is also hoped that other researchers will use these research findings for further studies and that these results will be helpful to schools that are yet to implement ICT in their syllabus.

1.4 STATEMENT OF THE PROBLEM

The Monarch of Eswatini, His Majesty King Mswati III (2010), highlighted the need for the Kingdom of Eswatini to be a first world country by the year 2022. His vision included every sector but most importantly education as every developing country needs to focus on education. To accomplish this aim and to respond to this vision, a Draft Policy for ICT Implementation (2012-2016) in schools was crafted (Simelane, 2013). To demonstrate their willingness to achieve this objective, NGOs and the government of Eswatini committed to equipping government and mission schools with computers. This is crucial even though it must be noted that the presence of ICT tools does not guarantee efficient and effective usage. Isaacs (2007) and Mndzebele (2013) revealed that 5% of primary schools made use of the ICT tools by integrating ICT in their learning. These were mainly private schools and a few public schools. Teachers and learners had not yet implemented ICT in teaching and learning in 95% of primary schools. Mndzebele (2013) further stated that, the use of ICT in primary schools in Eswatini was unstructured, haphazard and not a priority for many schools. This is why this study

investigated the factors influencing ICT implementation in inclusive primary schools in the Manzini Region.

1.5 RESEARCH QUESTIONS

1.5.1 Main research question

- What factors influence the implementation of ICT in inclusive primary schools in the Manzini Region in Eswatini?

Research sub-questions

- What are the teachers' attitudes towards the implementation of ICT in inclusive schools?
- What types of ICT tools are available in schools for the implementation of ICT?
- What are the teachers' proficiency levels in the implementation of ICT in inclusive schools in the Manzini Region?
- What challenges do teachers experience in the implementation of ICT in inclusive schools in the Manzini Region?

1.5.2 Aims and objectives

This study was designed to investigate factors that influence the implementation of ICT in inclusive schools in the Manzini Region.

This study will address the following objectives:

- To explore the attitudes teachers have towards the implementation of ICT in inclusive schools;
- To identify the type of ICT tools available in schools for ICT implementation in inclusive schools;
- To examine the proficiency level of teachers for implementing ICT in inclusive schools in the Manzini Region and
- To identify the challenges experienced in the implementation of ICT in inclusive schools.

1.6 LITERATURE REVIEW

This section provides a review of the relevant literature and a summary of the factors that influence ICT implementation in inclusive primary schools. The methodology used for the review of this literature was to search for academic books, journal articles, relevant websites, online reports and dissertations worldwide. Eyono (2011) describes the challenges and factors that can influence ICT implementation in inclusive schools as teachers' attitudes, learners' behaviour, policy related factors and socio-economic factors. These factors are briefly discussed below.

1.6.1 Teachers' attitudes

Many governments and institutions have recognised the important part played by teachers in ICT implementation and the need to place emphasis on teachers' development as a key aspect in ICT implementation (Ang'ondi, 2013). It has been observed that teachers are slow to adapt to change and to recognise the benefits of new technologies (Cassin & Eyono, 2011) and thus, according to Bhebhe and Maphosa (2018), learning opportunities are not fully exploited by teachers for remedial programmes.

Attitude refers to a mental state of getting ready for action (Singarusa & Dixon, 2008). The attitudes of teachers have a remarkable impact on ICT implementation, both positive and negative. Shiboko (2015) identified teachers' attitudes, such as computer rejection, edginess, self-efficacy, keenness and confidence as factors influencing the process of ICT implementation. Many teachers perceive ICT as a great advantage in teaching and learning but some still struggle to comprehend the benefits and to apply the methods for effective use (Oldfield, 2010).

Recent studies (Mustafina, 2016; Shiboko, 2015) show that the success of ICT implementation depends mainly on teachers' attitudes as their attitudes and beliefs have a major influence on the implementation of ICT (Hennessy & Onguko, 2010; Ilomaki, 2008; Mahat, Jamsandekar & Malavade, 2012; Mndzebele, 2013). Due to teachers' resistance to change, it has been found that resources would not be used optimally and the learners would not benefit from ICT (Sulaimani, 2010). Teachers' attitudes can be diverse, from positive, negative or ambivalent, depending on different factors that may influence and affect their attitudes (Mustafina, 2016). A number of studies (Mustafina, 2016; Schoolnet, 2010; Oldfield, 2010) have revealed these contrasting perceptions on the part of teachers. Other researchers (Mahat, Jamsandekar & Malavade, 2012) have found that the contrasting attitudes of teachers towards ICT

implementation and how this influences its use in schools, are important factors in determining the overall efficacy and efficiency of ICT in education. A survey in the United Kingdom (Becta, 2008) found that teachers displayed moderate positivity towards ICT contributions in teaching and learning and that elsewhere in Europe, teachers perceived that there was little done in primary schools regarding ICT implementation.

Attitudes are rooted in beliefs and they influence behaviour (Siragusa & Dixon, 2009). Mustafina (2016) argued that there are factors that may influence teachers' attitudes such as age, self-confidence, gender and knowledge. Sulaimani (2010) found that in Saudi Arabia, teachers' attitudes were affected by religion and culture, teaching conditions and gender. In a study conducted in Kuwait, Nico, Ruttena and Wouter (2012) concluded that the negative attitude on the part of teachers towards the implementation of ICT might emanate from a lack of information, skills and knowledge. The study by Nyakowa (2014) found that a contributing factor in Kenya- to teachers' negative attitudes was how ICT was implemented in the curriculum. In addition, according to Hennesy and Onguko (2010) and UNESCO (2017), there are three approaches that could be used in ICT implementation, namely: i) An *integrated approach* where ICT is used within subjects to illustrate certain concepts; ii) An *enhancement approach* where teachers will use ICT to enhance some topics through features of lessons and activities and; iii) the *complementary approach* where ICT sources motivate the learners, either as a separate subject or used in all subjects to enhance teaching/ learning.

This research attempts to provide a more detailed investigation regarding the approaches that are used by inclusive primary school teachers for ICT integration. The other factors that influence ICT implementation in inclusive schools as described by Eyono (2011) are discussed below.

1.6.2 Policy factors

When the right to equal education was formally recognised as a basic human right by the international fraternity (Mamba, 2019), many governments started to align themselves and developed policies to align with the common goal of placing education at the centre of the global development agenda (MoET Report, 2018). Eyono (2011) asserts that policies can serve major functions in any country or organisation whether big or small. Conversely, Hennesy and Onguko (2010) indicated that policies provide a visual representation, principles and set of aims of how systems in education would work. If ICT is to be successfully implemented to

benefit all parties involved in the education system, there should be proper policies to guide its implementation. Unless policies provide clear guidance and direction, education innovations would not be sustained (Eyono, 2011). Specific policies are moreover required that would help advance the inclusion of learners with special educational needs (UNESCO, 2018). Hennesy and Onguko (2010) and Mndzebele (2013), ascertained that technology in schools requires a monitoring and execution plan, as is required for any other project.

UNESCO (2015) suggested three recommendations for a good national education policy:

- Strategies to be in place for ICT competence to be developed in learners;
- Competencies for teachers and learners to be properly articulated and
- Examination goals and assessment methods and tools to be redesigned for the potential of ICTs in education to be optimised.

To implement national policies developed by government, schools need to have their own ICT policies. It is therefore important for principals and teachers, in consultation with Boards of Management and parents, to develop ICT policies to sustain ICT implementation in the school curriculum (UNESCO, 2015). Vanderlinde and Brack (2011) suggested putting policies for ICT in place, including addressing the leadership role of the head teacher, facilitating conditions to support ICT use such as skilled staff, ICT coordinators and access to ICT facilities, considering evaluation practices for ICT implementation and cooperation among schools with regard to ICT education as key aspects in school policy development for the successful implementation of ICT.

Many countries are committed to the implementation of ICT in inclusive primary schools but only a few have managed to develop strategies and policies to effectively implement and manage ICTs in inclusive schools (UNESCO, 2017). According to Mofarreh (2016) there is no syllabus nor a stand-alone policy for ICT implementation in Saudi Arabia. He further argued that ICT usage in schools relies mainly on the use of textbooks and not through pedagogy. The government of South Africa published a policy document on ICT in Education in 1997. The DoE's White Paper on e-Education (DoE, 2007) developed guidelines for the distribution of ICT in schools and the use of assistive devices to improve education quality and equity (Ndlovu & Donovan, 2012). This led to the introduction of ICT in many schools. Since then, South Africa is unequalled in moving forward with its ICT agenda (Farrel, Glen & Shafika, 2007). Most countries however still had draft policies of ICT in Education awaiting approval

(UNESCO, 2015). In Eswatini, the Ministry of ICT had developed a Draft Implementation Plan (2012-2016) but by 2020, this plan had not yet been adopted and implemented.

Policies may facilitate change but they do not guarantee implementation (UNESCO, 2015) and it has been noted that policies fail because teachers resist policies that are based on change that they consider imposed on them without their consent or when there are no programmes and resources aligned to such policies (UNESCO, 2017). The priority for policy makers therefore should be finding ways to capacitate teachers (Duta, Gieger & Bruno, 2015). Many countries do not identify within their policies how ICT implementation would be funded, where responsibilities lie or which roles are assigned to specific stakeholders in order to sustain the implementation of ICTs (UNESCO, 2015).

The third factor that influences ICT implementation in inclusive schools as described by Eyono (2011) is discussed below

1.6.3 Learners' behaviour and attitudes in ICT use

Research conducted on attitudes and the way they originate showed that beliefs and attitudes are co-joined, while behaviours and attitudes complement each other. Attitudes could therefore be divided into dislikes and likes (Siragusa & Dixon, 2008). In developing countries, learners' attitudes towards ICT implementation in learning were found to be diverse ranging from positive to negative (Mndzebele: 2013). Rhema and Miliszewska (2014) posit that most primary school learners had a positive attitude towards ICT. They further stated that, in developing countries, learners were still accustomed to traditional learning practices and viewed ICT as some sort of interference. In Botswana, most learners still had negative attitudes towards e-learning due to the socio-cultural environment (Thomas, van Dyk, Brown & van der Merwe, 2008). However, a study conducted in Pakistan revealed that the attitude of students towards ICT was very positive and that they viewed ICT as an added advantage to their studies (Hussain, 2007). A study conducted in Kuwait also showed that over 75% of learners enjoyed using computers for learning and that, for them it made learning exciting (Alharbi, 2014).

Teachers need to recognise that each learner is unique and has differences in their involvement, behaviours, needs, abilities and perceptions of factors within and outside the learning environment (Acarindex, Modupe & Balogun, 2011). All these characteristics need to be

accommodated in inclusive classrooms as they could influence ICT implementation. The application of new pedagogical technologies and methods of education that are appropriate could help in the accommodation of diverse needs of learners in inclusive classrooms. In this regard, MoET (2014) ascertained that ICTs are fast becoming suitable tools that could help improve the lives of learners with diverse needs or those experiencing barriers to learning to access equal rights to education, social life, leisure, employment as well as access to democratic information channels.

A study by Irfan and Noor (2012) however revealed that learners in many countries use ICT mainly for communicating and socialising with friends rather than other activity. Likewise, Charles and Yidana (2014) found that learners' internet and social media applications were very high in communication but very low for educational usage. This could be the result of low levels of competence in the usage of ICT by learners.

ICT implementation in inclusive primary schools has an influence on both teachers and learners in the way they teach and learn (Hennessy & Onguko, 2010; Kipper, 2012). They further ascertained that ICT empowers both teachers and learners, transforms learning and teaching because it encourages more collaboration and communication, learners are challenged to develop communication skills and creativity, the world of knowledge is accessed beyond the classroom and-, learners are empowered to be actively engaged in the learning process and learners collaborate and interact with each other.

1.6.4 The challenges of ICT usage in inclusive classrooms

The early stages in the development of a new system are crucial for its success (Mott & Leeming, 2013). If there was inadequate analysis at the beginning of the process, then there would be an insufficient understanding of the programme and both teachers and learners could miss important aspects for the successful implementation of ICT in inclusive classrooms. As a result, teachers could be misunderstood as anti-progressive (Al-Sulaimani, 2010). Several studies (Simelane, 2013; Tonui, Kerich & Koross, 2016; Muriithi, 2017) have revealed similar challenges in the implementation of ICT in inclusive schools. Some of the challenges are intrinsic, while some are extrinsic (Bhebhe & Maphosa, 2019 and Simelane, 2013).

Bhebhe & Maphosa (2019), Mndzebele (2013) and UNESCO (2015) further mentioned the following findings and challenges for effective ICT implementation among Southern African countries, namely: i) the lack of ICT training and limited knowledge on the part of teachers; ii)

teachers' attitudes towards ICT; iii) the lack of support for ICT-, and iv) the shortage of learning resources, clearly outlined curriculum and other learning materials needed for the effective use of ICT.

ICT implementation in Eswatini does not have an implementation plan (Isaacs, 2007). MoET has drafted ICT policies and schools were thereafter encouraged to use ICT in teaching and learning. However, according to Mndzebele (2013), there was still no institution in Eswatini that offered a degree programme for teachers to be ICT instructors. The training of teachers was viewed as one of the major impediments to effective ICT implementation in inclusive primary schools in Eswatini.

The challenges in the ICT implementation process in inclusive schools may differ in countries because of economic status, beliefs, culture and background. According to Mndzebele (2013), ICT in Eswatini has suffered failure thus far because of inadequate planning, the lack of funding and insufficient professional development initiatives. Madzima, et. al (2013) highlighted that ICT implementation in Eswatini primary schools still have many challenges such as: the limited availability of infrastructure and supporting elements, economic realities related to ICT use, inadequate training and teachers' workload, the lack of technical support to sustain ICT availability, and the absence of an ICT curriculum because of an inadequate regulatory framework.

Several studies were conducted on the factors influencing ICT implementation in inclusive classrooms. Shiboko (2015) conducted a study in Kenya on 'teachers as factors that influence the use of ICT in teaching English'. Mustafina (2016) conducted his study on 'teachers' attitudes towards the use of technologies and his focus was on teachers' attitudes. In Eswatini, Madzima, et. al's (2013) study was on ICT education in secondary schools, while Simelane (2013) also conducted a study on ICT integration in Science and Mathematics, focusing on teachers' ICT use in these subjects.

Using a qualitative approach, this research investigated teachers' attitudes, the types of ICT tools used in schools, the proficiency levels of teachers and the challenges faced by teachers in ICT implementation in inclusive schools. There may be different factors that influence teachers' attitudes towards ICT such as culture, background, socio-economic status and the environment and these were examined in this study.

1.7 THEORETICAL FRAMEWORK

A theoretical framework may be defined as ‘a paradigm of how one makes logical sense or theorises the relationships between the many factors identified to play a role in the problem’ (Sekaran, 2003). Graham (2011) and Bhebhe and Maphosa (2019) defined a theoretical framework as a “representation of reality; it defines those aspects of the real world, the researcher considers being relevant to the problem investigated and makes explicit the significant relationship among those variables”. In this study, a theoretical framework is understood to mean a map or a structure that describes the relevant factors for effective ICT implementation and by which the relevance of this study will be examined.

The framework for this study was drawn from a framework formulated by Koehler and Mishra (2003) titled ‘Technology Pedagogical and Content Knowledge’ (TPACK). This framework describes the relationship between the three fundamental sources of knowledge (pedagogy, content and technology). This model of ICT implementation in teaching and learning asserts that, in order to develop content, one needs an attentive scrutiny of these three fundamental sources of knowledge. Koehler & Mishra (2014) argued that these three are not separate but intertwined and place emphasis on teachers’ knowledge.

This model views teachers as independent agents with the power to significantly influence the appropriate ICT integration in teaching and learning. As stated in Section 1.6.1 and 1.6.3, even if all the resources were provided and learners were willing to use ICT and parents supported their use, teachers ultimately decide the fate of utilising such tools in the classroom (Cassin & Shiboko, 2015). Their attitudes, norms, beliefs, knowledge and understanding of ICT are vital (Ang’ondi, 2013). Therefore, the TPACK framework was used to understand and depict pedagogy, content and technology knowledge required by teachers for effective ICT implementation in inclusive schools.

This study focuses on the knowledge, skills and understanding teachers need in order to effectively use pedagogies to transmute the teaching and learning for all learners in inclusive primary schools. However, Mishra, Kohler & Henriksen (2014) emphasised that teachers need a better understanding of the present-day technologies, pedagogies and subject matter. Referring to Section 1.6.3, Acarindex et al (2011) indicated that teachers need to recognise that each learner is unique and has differences in their involvement, behaviours, needs, abilities and

the way they perceive factors within and outside the learning environment. With this understanding teachers would be able to enhance the teaching and learning process.

1.8 RESEARCH PARADIGM

A paradigm is a set of beliefs, premises, values and practices shared by the research community (Brown & Clarke, 2014). Research by Guba and Lincoln (2016) describes a paradigm as a source or distinct set of beliefs and concepts that people may have towards a particular concept or set of principles.

This study was embedded within the interpretive constructivist paradigm. Interpretive researchers believe reality lies in people's subjective experiences and understanding about the world (McMillan & Schumacher, 2011) They believe that there is no correct or incorrect theory. According to Maree (2016), an interpretive researcher does not stand and watch but participates while observing. Therefore, this research derived its findings from the field by examining the participating schools.

This paradigm is based on the ontological, epistemological and methodological assumptions as stated by Guba and Lincoln (2016). The ontological assumptions described were based on the nature of reality described by the participants from their points of view and investigated whether there was anything that could be known about their understanding of ICT implementation in inclusive schools. Regarding epistemological assumptions, I needed to understand and interpret the meanings attached to the research participants because there are many versions of reality and these are closely linked to the settings in which they occur in order for me to understand the environment and its effects. Lastly, this research applied the methodological assumption, based on the above referenced studies, to assist me to apply the preferred methodology.

1.9 RESEARCH METHODOLOGY

This section describes the methods used in the data collection process and for analysing the data. Guba and Lincoln (2016) stated that, in order to address the research problem, it is critically important to choose the correct methodology and to select a suitable research design. This section describes the research design, the sampling methods, the sample size and the target

population. Instruments, procedures for collecting data and data analysis methods used will be discussed in this section.

1.9.1 Research approach

A qualitative research approach was utilised. A qualitative study is descriptive and interpretative (Young & Ku, 2008). This approach enabled the study of behaviour as it occurs in its natural surroundings, in this case, with specific regard to their influence on ICT implementation in inclusive primary schools. I collected data using interviews, observations and open ended questionnaires, which helped to cross check and validate the data obtained, in addition to using other data collection strategies. Data was collected directly from interviewees on the chosen participants, administering open ended questionnaires with the focus on participants' understandings. Observations were conducted to validate data collected. The meanings were guided by the interpretive constructive paradigm. The research considered the ontological and epistemological aspects of the subjects to construct their own understanding and knowledge about the factors that affect ICT implementation in inclusive classrooms in the Manzini Region in Eswatini. According to McMillan and Schumacher (2010) the researcher's perspective and opinions would be reflected when the data was analysed.

1.9.2 Research design

The term research design refers to a plan for selecting subjects, research sites and data collection procedures to answer the research questions (McMillan & Schumacher, 2011). The research design for this study was an interpretive and descriptive case study.

According to Gay (1997), quoted in Simelane (2013), a case study is a strategy for data collection with respect to one or more variables to determine the status of a given population. Savin-Baden & Major (2013) further defined a case study as a system that involves collecting sufficient information regarding a social setting, particular individual, activity, group or event to give a clear understanding to the researcher, comprehending how the participants work. This design criterion was used because it was the most effective way of collecting data for this research.

1.10 POPULATION AND SAMPLING

Population is a group of people in which the research can be generalised and sample refers to the participants or group of individuals, which the researcher used in the data collection process (McMillan & Schumacher, 2011).

Purposive sampling is a technique where a researcher chooses participants possessing the information that the researcher is interested in. According to McMillan and Schumacher (2011), purposeful sampling refers to the choice of participants with the same characteristics. A purposive sampling procedure was used because the participants had experience and were directly involved in ICT implementation in inclusive primary schools. Two schools were chosen from approximately thirty-seven (37) primary schools that were implementing ICT education in the Manzini Region for the purpose of this study. The research used participants who were directly involved in ICT education in inclusive schools and the principals from the selected schools that had already integrated ICT education in their schools in the Manzini Region.

1.11 DATA COLLECTION TECHNIQUE

In qualitative research, the researcher wants to obtain direct information from the source, either by observation or by interviewing the participants in their natural surroundings (McMillan & Schumacher, 2011). Both primary and secondary sources were used for the collection of data in this research. Participants who I directly interacted with served as primary sources while secondary sources that were used included journal articles, government reports, academic books, handbooks and encyclopedias.

The methods used in this study were interviews, qualitative questionnaires and observations. Nine teachers responded to questionnaires, while two principals were interviewed, and four teachers were observed. The next section discusses the questionnaires, observation and face-to-face interviews.

1.11.1 Interviews

Interviews are methods of gathering data through pre-planned oral questioning. Interview questions can be in three forms, namely, structured, semi-structured and unstructured (McMillan & Schumacher, 2010). This study aimed to gather in-depth information on ICT implementation in inclusive schools. The study therefore used semi-structured interviews.

Interviews provide in–depth information because interaction occurred face-to-face. Interviews have high construct validity because the interviewer can ask the participant further questions where the need arises. The face-to-face interaction of the interviewer and the participant allowed the interviewer to gather in–depth insights. Individual interviews were conducted with two principals of the selected schools to explore in greater details the use of ICT in the schools and factors that influence their implementation in these inclusive schools. The interviews were also recorded to ensure that everything shared was first-hand information and enabled the researcher to concentrate on the interview itself instead of taking notes. Interviews also established a rapport between the interviewer and the participants (Nyakowa, 2014).

1.11.2 Qualitative Questionnaires

Questionnaires are a set of questions written for a certain purpose (McMillan & Schumacher, 2011). Young (2014) further defined questionnaires as a technique of gathering data using a list of printed sets of questions administered to participants with the relevant and required information. Open-ended questions were used in the questionnaires to allow participants to provide a narrative description of their competencies, experiences and understanding of the factors that influence ICT implementation. Nine teachers completed the questionnaires

1.11.3 Observation

Observation is a way for the researcher to realise and appreciate what occurred naturally in the research site (McMillan & Schumacher, 2010). Using observation, the researcher hoped to obtain a rich understanding of the phenomenon being studied. The researcher conducted a structured observation in the classes where teaching and learning took place to find out how learners were taught using ICT education. An observation sheet was used to record data collected during observations. Two teachers from each school, which resulted in a total of four participants being observed in their classes during teaching and learning.

1.12 Data analysis and interpretation

The process whereby the researcher attempts to summarise collected data is known as data analysis. The process where the researcher attempts to find meanings from collected data is known as data interpretation (Akaranga & Makau, 2016). Therefore, the data collected was

analysed qualitatively. Qualitative data analysis is a process of analysing data into categories and identifying patterns and relationships among the categories (McMillan & Schumacher, 2011). Data analysis was done in order to make sense of the collected data in accordance with the research questions. According to McMillan and Schumacher, (2011) data analysis should be done during and after data collection. The audio recorded responses to the interview guiding questions were categorised for interpretation and so were the questionnaires. The data was interpreted to provide explanations but the ontological and epistemological aspects of the participants was considered in order to understand and interpret the data correctly.

1.13 CREDIBILITY AND TRUSTWORTHINESS

As McMillan and Schumacher (2011) ascertained, credibility is the extent to which the results of a study approximate reality and are thus judged trustworthy and reasonable. It is further argued by Maree (2016) that in a qualitative study trustworthiness is important and it helps in the assessment of the worthiness of the data. Credibility and trustworthiness ensures that the analysis of the findings reflects the actual data that was collected, it also demonstrates that the evidence of the data analysis is sound. In this study, the use of multiple methods, interviews, qualitative questionnaires and observations were used in order to corroborate data sources to ensure trustworthiness and credibility. Furthermore, all interviews were recorded using an audio recorder.

It was further argued by Maree (2016) that for credibility and trustworthiness to be achieved, the participants could be given an opportunity to comment on the data interpretation to establish whether the researcher captured the participants' perspectives accurately. The researcher did member check with the participants to ensure that data was recorded accurately.

1.14 RESEARCH ETHICS

Ethics is that part of philosophy which addresses the behaviour and conduct of people and guides them in relation to other people (Akaranga & Makau, 2016). Akaranga & Ongong'a, (2013) refer to ethics as the conduct or the way of life that differentiates acceptable and unacceptable behaviour. Stephens (2013) defined ethics as grounds for making decisions about what good conduct is. Akaranga & Makau (2016) further asserted that research ethics has outlined rules and guidelines that describe a researcher's behaviour. The researcher is ethically

responsible for protecting the rights and welfare of the subjects who participate in a study. Research ethics therefore focuses on what is wrong and right and what is improper and proper from a moral point of view while conducting the research. Research ethics were applied in this research by obtaining permission, informed consent and assent as attached in Appendices D, E, F G and H.

- Ethics clearance was obtained from the UNISA College of Education Ethics Review Commission.
- A letter requesting permission from the Ministry of Education in Eswatini;
- A letter of request to the school principals and head teachers
- A letter of request to individual participants (teachers) and
- A consent form.

1.14.1 Informed consent

Informed consent means that subjects must be fully aware of the objectives of the study and how the findings would be used. The researcher should give participants the assurance of confidentiality and anonymity and describe the intended use of the data. The participants should be told that their participation is free and voluntary and that they can withdraw their participation if they feel uncomfortable. Informed consent is viewed as a process of engaging in dialogue with prospective participants. In this process the participants were provided with an explanation of what the research would be about and they were assured that their participation was voluntary. They were also informed that they were free to withdraw from the research if they did not feel comfortable to participate; I assured them that there would not be any consequence for their withdrawal. It was explained that their participation would not cause any harm whatsoever. Akaranga & Makau (2016) state that this could only be achieved if the researcher guarantees confidentiality to the research participants and respects anonymity.

1.14.2 Confidentiality and anonymity

The researcher has the responsibility to protect the individuals' confidences from others in the research setting and from the general reading public (McMillan & Schumacher, 2010). I explained to the participants that all information gathered would only be used for this research purpose and their responses would be kept anonymous. They were therefore requested not to write their names on the questionnaire. In the observations, no photographs were taken and

the names of the participants and learners were not used. During the interviews, only voice recorders were used and no photographs were taken. Participants who completed the questionnaires were requested to respond to the question items electronically as the majority of them had internet access and were already in regular communication with each other virtually.

1.15 LIMITATIONS AND DELIMITATIONS

Limitations are influences that the researcher cannot control and delimitations are choices made by the researcher which should be mentioned. Limitations and delimitations of the study are discussed below.

1.15.1 Limitations of the study

The findings of the study were that it was specific to the participating schools and not to other schools or to other regions. The main limitation of this study therefore was that its findings cannot be generalised beyond the participating schools and region.

Challenges that were anticipated were that some participants could withdraw from participating and that some questions would not be completed. Indeed, one participant withdrew from completing the open-ended questionnaire.

1.15.2 Delimitations of the study

The study was limited to two schools in the Manzini Region as this region has many schools that have started ICT education. This research did not include schools from other regions due to time and financial constraints.

1.16 DEFINITION OF KEY CONCEPTS

Primary education: In Eswatini, primary education commences at age five, six or seven and lasts for seven years. Primary education has two levels: lower primary (Grade 1-4) and higher primary (Grade 5-7). The primary school programmes do not necessarily require pre-primary education or previous formal education although the Eswatini government has started

programmes to introduce pre-primary education in all primary schools. There are primary level examinations currently used to qualify learners to advance to the secondary level. This study has adopted the above definition of primary education.

Information and Communication Technology: Mudzimba, Dube and Mashwama (2013) define ICT as resources used to create, disseminate, store, transfer and manage information or the different sets of technological tools. Mamba (2019) defined ICT as the digital network and internet, as well as other digital devices and various digital applications used with these tools. In this study, the term ICT is a wide collection of computer-based instruments, procedures, environments, resources and skills used for processing, communicating and obtaining information.

Policy: This refers to “a course of action adopted by government, through legislation, ordinances and regulations, and pursued through administration and control, finance and inspection with the assumption that it would be beneficial to the country and the citizens” (Alikor, 2014 as cited in Mamba, 2019). While Anderson (2016) defined policies as the principles used to set directions and guide an organisation, it can be a course of action to influence and guide decisions. Therefore, Mamba’s (2019) definition was adopted for this study.

Inclusive Education: The Kingdom of Eswatini’s national response to the psychological needs of children (2010:25) defines inclusive education as a policy approach that includes meeting all learners’ needs and enabling the school to welcome and equally serve all learners. Mariga, McConkey and Myezwa (2014) define inclusive education as the right of all children to attend school in their community in regular classes with peers of their own age. In this research, inclusive education means accommodating learners with diverse disabilities and learning difficulties in a classroom alongside their peers in their natural environment, with learners who do not live with any disability.

Curriculum: This refers to performance standards, skills and knowledge learners are expected to acquire in a particular grade or level (Mamba, 2019). It is the integrated course of academic standards. In this research, curriculum is the skills and knowledge that learners are expected to learn in a particular subject at a certain grade level.

Education: According to Simelane (2013) and MoET (2017), education refers to all the experiences, skills and knowledge gained by learners, from both society and schools.

Therefore, education is the skills and knowledge gained formally and informally from school and society.

Mainstream: Butter-Adams (2018) and Majola (2019) defined mainstream as a school which combines children with diverse disabilities into classrooms with their peers who have no disability. Therefore, in this research a mainstream school is where learners with disability are taught together with learners without any disability. The two terms are used interchangeably with inclusive schools.

Inclusive primary school: According to MoET (2017) an inclusive primary school in a Eswatini is a school where all learners are taught irrespective of their diverse disability or learning challenge.

1.17 CHAPTER OUTLINE

This first chapter outlined the introduction and background of the study, followed by a problem statement. The objectives of the study were outlined as well as the questions that guided the study and the significance of the study. A brief review of the literature, theoretical and conceptual frameworks were discussed in this chapter. This chapter further discussed the limitations and delimitations of the study and how ethical considerations were taken into account. This chapter concludes by defining the key terms used in the study.

The second chapter reviewed relevant literature related to this study. Studies on the importance of ICT education in primary schools and factors that influence ICT in primary schools were reviewed in detail. The theoretical framework of the study was also discussed.

The third chapter discusses the research methodology and all the strategies that were used in the collection of data such as the research approach, research design, population and sampling, data analysis and interpretation.

Chapter four consists of the data analysis and interpretation, the findings and results from the research captured in relation to the research objectives.

Chapter five is the last chapter of the research and consists of the summary and conclusion as well as recommendations for future research. These were based on the findings discussed in Chapter four.

1.18 CONCLUSION

This research was a qualitative case study using the interpretive constructivist paradigm. This research study was conducted in the Kingdom of Eswatini in two inclusive primary schools in the Manzini Region. The background introduced ICT education implementation and explained the context, provided an introduction, the rationale for the study as well as the problem statement which addresses the level of ICT education integration in Eswatini's inclusive primary schools.

The rationale for the study and focal points have been laid out to assist in the effective implementation of ICT education in inclusive primary schools that are already in the process of implementing ICT in their teaching and learning processes. Data was collected using different strategies from selected participants. The data was analysed and conclusions were drawn from it.

In the next chapter issues regarding ICT implementation in inclusive primary schools, teachers' attitudes and the types of ICT used to enhance the education of learners with diverse disabilities are discussed.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The primary objective of this literature review is to highlight important aspects of how ICT could be comprehensively influenced and implemented in inclusive primary schools, that is, at grassroots level. The literature highlights the factors influencing ICT implementation in inclusive primary schools, including the status of ICT in these schools, teachers' proficiency levels to effectively implement ICT and a comprehensive review of the challenges experienced by teachers during ICT implementation in inclusive primary schools. This chapter also discusses the gaps in the literature, the theoretical framework and provides a summary of what was discussed in the chapter.

Many researchers (Eireann, 2015; Kalaš, Bannayan, Conery, Laval, Laurillard, Lim, Musgrave, Semenov & Turcsányi-Szabó, 2012; Madzima et al, 2014 and Simelane, 2013) have viewed ICTs as tools that allow learners to access educational opportunities and improve academic performance. The provision of ICT and internet connectivity in schools are therefore essential to provide learners with what is commonly referred to as 'twenty-first century skills'. As rapid technological developments constantly drive and reshape the economy (Koech, 2018), it is vital for learners and teachers to be highly proficient in the use of ICTs. The barriers to ICT integration can therefore be viewed as deprivation to both teachers and learners (Koech, 2018 and Wachiye, 2012).

The world is undergoing the Fourth Industrial Revolution (4IR) which is promising profound change that will influence our lives positively, particularly in terms of teaching and learning but it could also threaten and undermine human capacities (Schwab, 2016). The Minister of Education and Training (MoET) (Mabuza, 2019) emphasised in her speech to teachers that expectations of society have evolved significantly in the current context (Majola, 2019). The World Economic Forum (WEF) (2017) stated that this is more than just change driven by technology but an opportunity to assist everyone, people from all income groups, requiring policy-makers and leaders to support converging technologies in order to create a more inclusive and humane future. This means that educators and the whole education system from primary to tertiary level have to rise to the challenges that come with the 4IR in education. As

greater use is made of ICT, the people who do not have access to ICT facilities and equipment would be at an increasing disadvantage. This requires teachers and learners to have the necessary skills to manage, implement and effectively use new technologies in education (Butter-Adams, 2018).

As learners strive for education, they have to be prepared from an early age for inclusive education, kept abreast of everything around them; how things are happening and why these developments are taking place. The 4IR demonstrates the development of new technologies that reflect how they integrate human and technological capabilities to perform tasks that were previously only possible through human actions (Kennedy, 2019). The schools need to prepare learners for the 4IR by building and instilling key values and skills such as critical thinking, problem solving and creativity (Adam, 2018 and Kerry, 2019). Learners should therefore be taught to be creative and innovative but they should also be able to question the fundamental values and what is wrong and right when using technologies. Kerry (2019) further concluded that the school is the only social safety net to prepare learners for the 4IR while not neglecting to teach the importance of being human.

2.2 ICT IN PRIMARY EDUCATION

ICT impacts on our lives directly on a daily basis. More interestingly, the practical uses of ICT that have surfaced recently could potentially make our lives more entertaining and richer (O'Leary, 2014). Integrating ICTs in primary school education is therefore more than just the availability of ICT tools but extends to the ability to use computers and other technological tools with pedagogies to order to enhance students' learning to achieve the learning objectives, goals and outcomes (Bhebhe & Maphosa, 2016). Their findings were consistent with Madzimba, Dube & Mashwama (2013), who argued that the easiest path is to acquire the technologies in schools. The crucial aspects to be considered for the attainment of learning objectives, goals and outcomes include pedagogy and curriculum, long-term financing, institutional readiness and teacher competencies. The study by Eireann (2015) concurred that ICT can transform teaching and learning when used appropriately with correct methods, as it can change the traditional classroom where the teacher is in control of learning to a classroom where learners learn collaboratively and discover knowledge for themselves.

ICT in primary school education comes with many benefits because it encourages individual information search from internet sources by learners and their ability to independently organise

established information (Simelane, 2013). Bhebhe & Maphosa (2016) further demonstrated that in primary education, ICT implementation increases the responsibility of learners as they work more independently. This can help learners as they progress through the schooling system. It is also important that learners are familiarised with ICT while still at primary school which is an early stage, because the skills acquired are important for future education and adult life. In the implementation of ICT in the primary school curriculum, specific objectives and aims should be met in order for ICT to enhance teaching and learning (Hennessy & Onguko, 2010; Kipper, 2012; Meenakshi, 2013; Zielesinski & Darling-Hammond, 2018). The aims could include: i) that learners should be able to use a variety of ICTs to enhance their understanding and learning of the curriculum; ii) that learners are able to enjoy new learning experiences by using ICT skills to attain learning objectives as articulated in the curriculum while also enabling learners to understand and practice safe use of ICT; iii) that learners are able to learn without hindrances for accessing learning resources caused by language barriers, geographic location and culture; iv) that ICT tools are used to establish a creative and effective teaching and learning environment; v) that there are well informed attitudes on the part of learners regarding the societal role played by ICT as well as an appreciation for the challenges and benefits that comes with ICT usage and vi) that learners should be encouraged to develop social skills through cooperative and collaborative learning.

Technology has within a very short period of time become an integral part of modern society and in organisations of all sizes. Some researchers (Eireann, 2015; Meenaskshi, 2013; Zielesinski & Darling-Hammond, 2018) argued that ICT should be integrated very early into the primary school curricula so that the learners produced would be independent and computer literate. Eireann (2015) further suggested that ICT usage in teaching and learning has to be taken seriously by every school, in every classroom and in every area of the curriculum in primary schools.

For the successful implementation of the ICT programme in educational activities, schools should have strategies in place to provide for the current expectations and future trends. Meenaskshi (2013) suggested some important facts that need to be considered in ICT implementation in primary schools, including the following:

- The development of ICT in society calls for reforms in the education system to implement and infuse ICT into teaching and learning;

- The ICT influence in learners' lives cannot be ignored, especially the internet (open-source tools). This calls for a redirection to open sources in learning activities and gradually moving away from manual sources;
- The use of online and multimedia gaming is a serious issue that cannot be avoided but should be wisely managed by teachers and all stakeholders in the education system;
- Many governments have paid little or no attention to ICT implementation and consequently it is low on the list of priorities in educational reform. To enhance ICT implementation, governments should be actively involved in its implementation and
- For the successful ICT implementation in primary schools, teachers should be initiators and motivators of the programme.

This study therefore aimed at establishing how ICT was implemented in the school curriculum to meet the above-mentioned aims and objectives.

2.2.1 Learners' behaviour and attitudes

In developing countries, most students have a positive attitude towards ICT implementation in learning (Rhema & Miliszewska, 2014). They further stated that some students are however still more familiar with the traditional learning practices and view ICT as an interference. In Botswana, students still have negative attitudes toward e-learning due to the socio-cultural environment (Thomas, van Dyk, Brown & van der Merwe, 2008). A study conducted in Pakistan however revealed that the attitudes of students towards ICT use were very positive and they believed ICTs were an added advantage in their studies (Hussain, 2007).

The incorporation of ICT in primary schools in Eswatini is a relatively new phenomenon which has not been fully exploited by teachers for teaching and learning (Bhebhe & Maphosa, 2018). Eswatini's present education system is undergoing reforms in order to align it to the King's Vision 2022. The integration of ICT (internet and computers) is not just the presence of these tools in schools but pertains to the effectiveness and efficiency of how the internet and computers could best be used for improving education, both in non-formal and formal settings at all levels (Chris, 2015; Bhebhe & Maphosa, 2018). In 2017, an organisation called 'One Laptop Per Child' facilitated ICT implementation in primary education by donating 300 mini laptops to some schools in Eswatini (Bhebhe & Maphosa, 2018). It however remains the responsibility of teachers to choose the right technology tools for effective teaching and learning to take place. Successful ICT implementation is about finding most appropriate tool

to create synergy with the principles and methods of teaching and that conveys the content clearly (Coker, 2016 in Bhebhe & Maphosa, 2018).

In 2017, there were 624 primary schools in Eswatini and most of their funding came from government (Annual Education Census (AEC) Report, 2018). Basic education is provided to learners over a seven-year period, from the ages of six to approximately thirteen, depending on factors that may lead to learners completing primary education above this age (Isaacs, 2007). The Eswatini government has committed itself to providing free elementary school education in response to the call for Universal Primary Education (UPE) and Equal Education For All (Simelane, 2013). According to UNICEF (2018), 96% of primary schools in Eswatini have electricity. The availability of electricity in most inclusive primary schools is a potential positive factor for development, as ICT could be introduced in all primary schools in Eswatini irrespective of their location.

The current ICT status for each region and the teachers with ICT qualifications, assists to understand ICT access in inclusive primary schools in Eswatini. A report of the education census (MoET, 2017) shows the following:

Table 2.1- ICT status in inclusive primary schools in Eswatini

REGIONS OF ESWATINI	HHOHHO	MANZINI	LUBOMBO	SHISELWENI
Number of primary schools	172	181	131	140
Integrated ICT in their curriculum	33	37	12	17
ICT Teachers in Primary schools	3	1	2	1

The table (above) shows that there were very few teachers who were trained in ICT education in the four regions and that means many teachers had not been exposed to any training but were expected to implement and use ICT in schools for the purpose of teaching and learning. One therefore needs to examine teachers' proficiency levels and how ICT is integrated to transform the teaching/ learning process without the necessary skills, including content, pedagogy and

technology knowledge as these bodies of knowledge are important in the process of ICT integration in schools (see Section 2.9).

Following this report in 2017, NGOs, the government of Eswatini (2018: 98) as represented by the Minister of Education and Training committed to introduce ICT as a subject in all primary schools, conduct continuous professional development workshops for ICT teacher, provide the basic infrastructure required for introducing ICT in schools and improve inclusive teaching/learning through the integration of ICT, with special focus on learners with diverse disabilities and learning difficulties by 2022.

Whilst research by Mamba (2019) has demonstrated the potential of ICTs in enhancing the education of learners with diverse disabilities and learning difficulties, in contrast, a study by Rose (2013) identified some limitations for its integration for primary school learners. This means that while teachers and other stakeholders should be encouraged to assist primary schools in their integration of ICT, the following should also be taken into consideration:

- Some programmes may not be as good as they claim to be. School principals and teachers need to be selective when choosing programmes for learners;
- There is right and wrong information that can be accessed from the internet and this may be damaging for primary school learners;
- ICT teachers need to refine media literacy for learners so that they are able to use and interpret multimedia for learning objectives and
- Psychological factors should also be taken into account as some learners may be more vulnerable to believe in fantasy, may confuse the real and the imaginary or find it difficult to transfer information obtained in the virtual world to the real world and to understand the difference. Too much preoccupation with the virtual world may also hinder learners' ability to acquire conventional literacy.

Every level of education in Eswatini, from early childhood to adult education is affected by this above-mentioned transition and yet, among all these levels as proven by several research studies, early childhood and primary education are the most formative stages. Heckman (2010) argued that the early years of a child's life are sensitive periods for the development of cognitive skills. It was for this reason that I decided to focus this study on inclusive primary education and ICT as a means for nurturing new learning and new pedagogies.

2.4 ICT FOR INCLUSION

“Education is mostly regarded as a potent artillery that can be used to facilitate change in the world”, Nelson Mandela as quoted by Rose (2013) in the World Education Blog. To facilitate change will require every country to take considerable action to achieve equal education for All. Education for all will mean integrating learners with diverse disabilities into the mainstream alongside their so-called ‘normal’ peers, by providing extra support that enhances their learning. This also suggests being innovative and adjusting the curriculum using 21st century pedagogies to accommodate all learners. Despite this global call of ‘Education For All’, Henriksgard (2019) revealed that many children (approximately 150 million) worldwide living with disabilities were still faced with exclusion from educational opportunities. This is mainly because one size will not fit all (Irish National Teachers Organisation, 2015) and special attention must be paid to diverse learners’ needs. All stakeholders in education should respect and recognise that all learners’ needs are not the same in an inclusive classroom. This would include providing support to all learners and teachers and the education system would have to reconsider teachers’ roles and acknowledge the wide range of learner needs. As the teachers’ roles change in the teaching and learning process, it is important to use strategies that benefit all learners in the classroom.

When we consider using ICTs for learners with diverse disabilities and learning challenges, ensuring that the technology is used by the learners is very important (Mamba, 2019). Therefore, an inclusive school has to provide all the basic tools that support learning even for those with diverse disabilities and learning difficulties. This will prepare all learners for life-long learning and the world of work. In Eswatini, Bhebhe & Maphosa (2016) argued that ICT usage had been poor and not adequately used to address the needs of learners with diverse disabilities and learning difficulties. Moreover, other researchers ascertained that in many countries, learners with diverse disabilities who are in mainstream schools were not receiving adequate levels of support (Kalas et al, 2014; Bhebhe & Maphosa, 2016). It is worth noting that integrating ICTs is now globally featured in the development agenda, more specifically in Sustainable Development Goal 9 (SDG9) on innovation as well as SDG4, which commits the international community to ensure equal and inclusive education and the promotion of lifelong learning opportunities for all (UNESCO, 2017).

An inclusive education system is about being considerate of diversity among learners and provides equal learning opportunities for all learners in the regular schooling system (MoET, Education Census, 2017; UNICEF, 2018). Inclusive education makes it possible for learners

with or without disabilities to attend the same age-appropriate classes at a school that is closer to them, with additional, individually tailored support that they need (UNESCO, 2015). Inclusive education encourages personalised learning (UNESCO, 2015; Shan, 2013) which requires attention to the different needs of all learners including those learners with mild, moderate and severe disabilities (Panzavo Ita & Lotti, 2012). It was further noted by Links (2013:37) and Tonui, Kerich and Koros (2016) that the use of ICT in education enables flexibility in curriculum development and aids learners with disability to be part of the learning experience as equals. This could be possible in education through the use of assistive technology (AT).

Assistive technology could be any product, piece of equipment, system or service that is used to improve, maintain or increase operational capabilities of individuals with disabilities (Hemlata, 2013). ICT for inclusion could occur at an individual level or at a systemic/ institutional level. Starcic (2010) argued that the effective use of ICTs could significantly affect the learning environment in a positive way by improving efficiency in the education of learners with diverse disabilities in inclusive classrooms. Easy access to learning is viewed by Hemlata (2013) and Simelane (2013) as one of the major contributions of ICT in the field of education.

Annual Education Census (2017) produced by MoET revealed that there were about eight thousand (8000) learners with diverse disabilities who were enrolled in the primary education system. The majority were reported to have visual disability (2696) followed by hearing difficulties (2280). The report further revealed that most of these learners spend many years in primary schools due to grade repetition and-, insufficient help and resources. This report, as indicated below, is an analysis of learners with diverse disabilities according to their learning grades.

Table 2.2: Learners with diverse disabilities’ report 2017 for inclusive primary schools in Eswatini

	Gr. 1	Gr.2	Gr.3	Gr.4	Gr.5	Gr.6	Gr.7	TOTAL
Visual impairment	177	189	284	485	566	519	476	2696
Learning disability	347	358	418	415	343	229	170	2280

Hearing impairment	169	208	232	348	363	284	203	1807
Physical disability	89	61	60	58	57	62	40	427
Other impairment	78	57	66	65	59	66	58	449

Source: AEC (2017)

Due to the implementation of ICT, the field of higher education has been greatly transformed (Henriksgard, 2019) and primary education could also be transformed if ICT could be integrated effectively to enhance inclusive education. ICT implementation could influence and enhance the education of all learners (Koech, 2018) including those with diverse disabilities because of the changes in how learners are taught and how they learn as the processes are more learner driven. The concept of ICT for inclusive education should therefore be one of the major focus areas for every developing country in order to provide learning opportunities for all learners regardless of their individual capabilities.

2.5 TYPES OF ICT TOOLS IN PRIMARY SCHOOLS

ICTs in education are featured in different modes of learning, including e-Learning, teleconferencing, open and distance learning and blended learning (Tonui, Kerich & Koross, 2016). Koech (2018) further divides ICT devices in teaching/ learning into software, hardware, and network communication. The different ICT tools increase the flexibility in the delivery of education so that knowledge can be easily accessed by learners from anywhere and at anytime (Zielezinski & Hammond, 2018). Hsu (2017) and Koech (2018) suggested teacher-designed materials e.g. group progress records and activity sheets, reference software, multimedia presentation software, scanner and scanning software, the internet and smart boards as ICT tools that could be used to transform education for all learners in primary schools.

Some learners with diverse disabilities and learning difficulties will need add-on devices to help them access both assistive technology software and ICT software (Daniel et al, 2014 and UNESCO, 2015). These include key guards, touch screens, concept keyboards, switches, alternative keyboards and alternatives to a mouse such as tracker ball, rollerball and joystick.

Some researchers (Eireann, 2015; Koech, 2018 and Tonui et al, 2016) suggested three approaches to ICT integration in primary education. UNESCO (2015) indicated that attainment

could be enhanced by all three approaches, but the effects may be different. All three approaches however necessitate extensive teacher knowledge of ICTs and the ability to extend their pedagogical knowledge or adapt ICTs to fit into their existing pedagogy so that they can effectively accommodate ICT in their teaching. Below are the three approaches for ICT integration in teaching and learning.

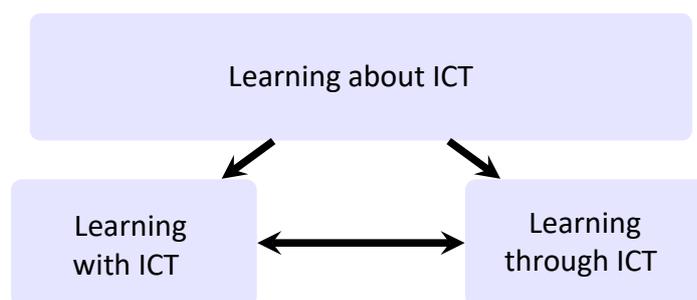
Learning with ICT: This is an integrated approach whereby teachers and learners use ICT resources to support the classroom curriculum and optimise information delivery (Koech, 2018). Tonui et al (2016) argued that ICT provides methods, tools, and resources for addressing the basic educational needs of all learners. This can be achieved through the use of computers for presentations and video clips that allow learners to appreciate and enjoy learning. According to Koech (2018), learners concentrate more when using technology than in traditional settings. It is argued by Chris (2015) that the reduction of information quantity, improved structure and quality can be achieved through ICT integration. It can be used to support different learning theories and be integrated into teaching and learning strategies.

Learning about ICT: This is a complementary approach where by teachers and learners use ICT and the learners are shown how the process of teaching and learning can be transformed by ICT, and how they can learn in new ways. This means that ICT can be taught in schools as a subject. Simelane (2013) posits that most schools in Eswatini integrate ICT as a subject because resources are available. Most schools, for example, have a computer laboratory where learners go and learn about ICTs during a specific time allocated for this purpose.

Learning through ICT: This is an enhancement approach whereby teachers' and learners' skills are developed and knowledge is acquired in the potential uses of ICT to support learning. The teaching and learning process is transformed by using modern ways of learning (Chris, 2015). The availability of computers to children in the comfort of their home for work and play can extend learning through ICT. This will neutralise the disadvantages experienced by underprivileged children and the digital divide can be bridged (Chris, 2015 & Meenakshi, 2013). This could be made possible by projects such as 'One Laptop Per Child' (OLPC) and be extended to e-learning and blended learning that can enable learners to learn without going to their workstation and accommodate those with physical disabilities. Technology can therefore be the most effective way of increasing a learner's knowledge.

These three ICT approaches (as presented in Figure 2.1, below) can complement each other to enhance learning. The three (learning through ICT, learning about ICT and learning with ICT) are mutually supportive and inter-related. When children are learning about ICT, this can develop and grow as an inherent part of learning with ICT (Mulinge, 2016). On the other hand, it is argued (Gikundi, 2016 and UNESCO, 2015) that the first step should be learning about ICT because learners would be introduced to ICT tools and assistive devices they are not accustomed to. Learning with ICT and learning through ICT will thereafter support the aims of ICT implementation in the primary school curriculum. Thus, emphasising different learners needs using pedagogy, content and different learning approaches can accommodate all learners. Teachers will then be able to use technology, pedagogy and content knowledge to transform teaching and learning.

Figure 2.1 Complementary approaches to ICT integration



Source: UNESCO, 2018.

This study attempted to provide a detailed investigation into the types of ICT tools available in schools and investigated how ICT was implemented in the teaching/ learning process.

2.6 TEACHERS' INTEGRATION PROFICIENCY

Research (Fig & Kamini, 2011) shows that various factors influence the implementation of ICT in inclusive primary schools, including the availability of resources, infrastructure, time and management. However, these factors cannot facilitate ICT integration in teaching and learning as there is a need for teachers to be equipped with the necessary skills so that they can

develop suitable materials for their context (Hassan & Abdullah, 2013). An important but difficult task is measuring changes in teachers' ICT integration. According to Hsu (2017), this is very important because it indicates how teachers use technology when conducting lessons. This proves to be difficult because of the rapid change in technology and the different methods of integrating ICTs.

Research has shown that the uptake of ICTs by teachers is mostly influenced by rewards, a supportive and collegial school culture and available resources (Agyei & Voogt, 2014 and Uluyol & Sahin, 2014). Oldfield (2010) revealed that ICT is perceived by most teachers as advantageous to classroom learning but some found it difficult to identify methods for its use as well as specific benefits despite all the efforts to position ICT as a central pillar in teaching and learning in primary education. A research study by Konui et al (2018) asserted that many learners and teachers make only limited or no formal academic use of ICTs. Teachers tend to have different opinions on whether they feel ICT facilitates their work or whether it increases their workloads. A number of researchers (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012; Mndzebele, 2013; UNESCO, 2015; Koech, 2018 and Salam, et al, 2018) in their studies asserted that various factors, including intrinsic and extrinsic factors, including the lack of planning, the lack of training/professional development opportunities, the lack of technical support, electricity/ internet issues, lack of time, lack of planning, lack of knowledge and skills which result in a lack of confidence and teachers' attitudes, beliefs and their resistance to change are some of the impediments to teachers' proficiency levels for the integration of ICT.

2.6.1 Stages of ICT integration

According to Gikundi (2016) and UNESCO (2010) teachers' proficiency levels vary in stages as presented in Table 2.3, below:

Table 2.3 - Stages of ICT integration

LEARNING ABOUT ICT	MAIN CONCEPTS	TEACHING WITH AND THROUGH ICT
Becoming aware of ICT	Emerging	Create and manage a learning environment that is innovative

Understanding when and how to use ICT	Infusing	Facilitate learning using multi-modal instruction
Learning using ICT in content teaching	Applying	Enhancement of traditional teaching
Specialising in the use of ICT	Transforming	Applying productivity tools

Source: UNESCO, 2015

Teachers in the emerging or orientation stage are those who are beginning to be aware of the benefits of ICT in inclusive education but lack the confidence to use ICT in teaching and learning. Teachers who start using ICT in teaching and learning but do not have adequate skills to trouble shoot any problems encountered during the implementation process are grouped in the applying stage. Infusion stage means teachers are using the different ICT tools appropriately in teaching and learning and they have the necessary skills. Lastly, in the transformation stage are the teachers who are able to transform the learning process using pedagogies of modern technologies.

Gikundi (2016) indicated that the main objective of this model is enabling individuals, stakeholders and institutions to determine the stage they are at as they implement ICT as this would enable them to allocate finances to improve teacher knowledge, skills and adaptability.

ICT implementation processes would therefore have to pass through the four stages (UNESCO, 2015).

2.7 EFFECTS OF TEACHER TRAINING ON ICT IMPLEMENTATION

For effective ICT implementation and sustainability, administrators and teachers must be competent in the use of technology. This means that they must have a wide technical understanding, financial administration, understanding of the social and curricular aspects of ICT education and its use in teaching and learning. According to Halverson (2018) for any technological innovation in schools to occur, leadership has to be uniquely positioned to lead. Muriithi (2017) argued that leadership has a vital role to play in ICT implementation in education as many ICT projects initiated by teachers and learners are weakened by the lack of support from administrators.

The issue of training has its own complications because there has to be effective training that can enable teachers to be sure of the content, pedagogy and knowledge (discussed in Section 2.9) of ICTs in the education of learners with diverse disabilities and learning difficulties in inclusive schools. One of the major challenges for ICT implementation in primary schools is the lack of training of teachers implementing ICT (Alshmrany & Wilkinson and Hsu, 2017). Teachers should be trained and be introduced to using the different ICT tools common in classrooms such as computers, white boards, projectors, digital cameras and assistive technologies. Tonui et al (2016) suggested that training should not only focus on ICT teachers but all teachers in the school because all teachers need to keep abreast of the fast-changing world of technology. This was echoed by Barakabitze, et. al's (2019) study when they argued that teachers need to be well capacitated on ICTs before they can integrate these effectively in teaching and learning.

As stated earlier, the expectations of society have evolved significantly in the 4IR and acceptance of change, including ICT integration from both teachers and administrators is key for the implementation of ICT in schools. It is also important to mention that teachers should learn to adopt and adapt to the new trends of teaching using ICTs in order to align themselves to the needs of the twenty-first century (Barakabitze, et al, 2019 and Mustafina, 2016).

2.8. THE IMPLEMENTATION OF ICT IN PRIMARY SCHOOLS INTERNATIONALLY

Educators stand at a crossroads in the world (Zielezinski & Darling-Hammond, 2018) as technology use in education becomes an international issue.

2.8.1 ICT in the Republic of Ireland

ICT in Irish primary schools were used to reduce barriers to learning and to enhance the education of learners with diverse disabilities (Irish National Teachers Organisation, 2015). Furthermore, Craith & McCafferty's (2017) findings revealed that Irish teachers have embraced ICT despite the challenges faced such as insufficient funding and the lack of technical support from government. This is mainly because there are more ICT benefits than challenges. Their findings also revealed that learners are more motivated and engaged when

ICT is used as a teaching tool. As asserted by Long et al. (2016), AT has changed the learning experiences of learners with diverse disabilities and learning difficulties in Irish primary schools. However, the findings by Craith & McCafferty (2017) indicated that teachers were still at different levels of familiarity with AT but rated the influence of AT as positive in the education of learners with diverse disabilities and learning difficulties.

2.8.2 The use of ICT in primary schools in Kenya

A study by Tonui et al (2016) revealed that ICT in primary education in Kenya is yet to be extended for teaching and learning. However, Wambiri (2017) found that the Kenyan government committed to providing all primary schools with ICT tools in order to enable teachers to integrate ICT into teaching and learning. Despite the efforts by government, the competencies, beliefs, self-efficiency and attitudes of teachers remained a key challenge in ICT integration in primary schools in Kenya.

Learners with diverse disabilities and learning difficulties present challenges that teachers find difficult to address on their own in the classrooms (Mulinge, 2016). Therefore, Mwangi and Orodho (2014) emphasised the need for strengthening policies that promote inclusivity in education and improve the cooperation between government and schools and where they are able to monitor and evaluate outcomes. Mukhari (2012) and Gikundi's (2016) findings indicated that teachers in Kenya did not frequently use ICT to enhance the teaching and learning process. However, the learners liked learning with computers but did not have the skills needed to use computers. In 2015, Chris ascertained that it was difficult for teachers to adopt ICT integration in education because they lacked the skills and competencies to do so.

2.8 STUDIES CONDUCTED ON THE FACTORS INFLUENCING ICT IMPLEMENTATION IN PRIMARY SCHOOLS

A study by Grace (2012) in Kenya on the factors affecting the implementation of ICT integration in education found that the Kenyan government had committed to facilitate the availability and accessibility of ICT to teachers on demand. However, she asserted that there were still factors that needed to be addressed for successful ICT implementation in primary schools. These were infrastructure availability, access to electricity and the availability of ICT tools. Grace further stated that there were more pressing needs in primary schools in Kenya

than ICT programmes. Tonui et al's (2016) findings indicated that the greatest challenge faced by teachers in primary schools in Kenya was the unavailability of computers and they further ascertained that primary schools have yet to take advantage of ICT to extend access to education. In 2017, Muriithi's study was carried out to investigate factors affecting implementation of ICT education in primary schools in Kenya. He ascertained that: i) Teachers and head teachers in primary schools were well trained on the ICT curriculum; ii) The number of teachers did not meet the teacher-pupil ratio in primary schools; iii) There was poor infrastructure; iv) ICT policies were not effective and v) There was a lack of administrative support especially from head teachers and school boards.

Muriithi's (2017) findings indicate that although there was significant improvement in the implementation of ICT in primary schools in Kenya, the challenges were the same as those identified by previous researchers.

In 2012, Khan, Hasan and Clement, in their study in Bangladesh on the challenges to ICT being introduced in developing countries found that ICT still had many impediments such as: insufficient funds, a lack of resources and ICT supported infrastructure, teachers' attitudes and beliefs, the lack of a clear vision and plan, lack of time, social and cultural factors, the lack of skills and knowledge as well as political factors.

From the review of the literature above, it is evident that a number of studies (Khan, Hasan & Clement, 2012; Muriithi, 2017 and Tonui et al, 2016) have been conducted on the factors influencing ICT implementation and integration in primary schools. Teachers' attitudes, the availability of ICT tools in schools, teachers' proficiency levels and the lack of skills and knowledge on the part of teachers implementing ICT in inclusive school have been found to be the major impediments to ICT implementation in primary schools. However, the contributions, the context and scope of other studies do not address the question of the factors influencing implementation of ICT in inclusive primary schools. From the review, we do not know whether the factors identified in other studies cited from other countries could be the same as those that influence ICT implementation in Eswatini. There was therefore a need to identify the factors influencing the implementation of ICT in inclusive primary schools of the Manzini Region in Eswatini. The following section will be a discussion of the theoretical framework that guided this study.

2.9 THEORETICAL FRAMEWORK

A theoretical framework is the researcher's lens with which to view the world (Grant & Oslo, 2014) and it is derived from an existing theory or theories in the literature that has already been tested and validated by other researchers and is considered a general acceptable theory.

The Technology Pedagogy and Content Knowledge (TPACK) theory was chosen for this study. This theory was developed by Mishra and Koehler (2003) to be called the Technology Pedagogy Content Knowledge (TPACK). According to Mishra and Koehler (2003), in this theory, teachers draw upon the different kinds of knowledge to successfully teach with technologies. Mishra and Koehler built on Shulman's (1986) concept of Pedagogy Content and Knowledge (PCK). This framework was developed to explain the sets of knowledge, understanding and skills needed by teachers to effectively become intermediaries of the transmission of learning in the 21st century (Mishra & Koehler, 2003; Mishra & Koehler, 2009; Mishra, Kohler & Henriksen, 2014). Mishra and Koehler (2014) further argued that, according to this theory, teachers are viewed as independent agents with the power to apply the appropriate pedagogies in technology integration.

This suggests that any school wishing to implement ICT in teaching and learning has to empower teachers with the three bodies of knowledge, namely,

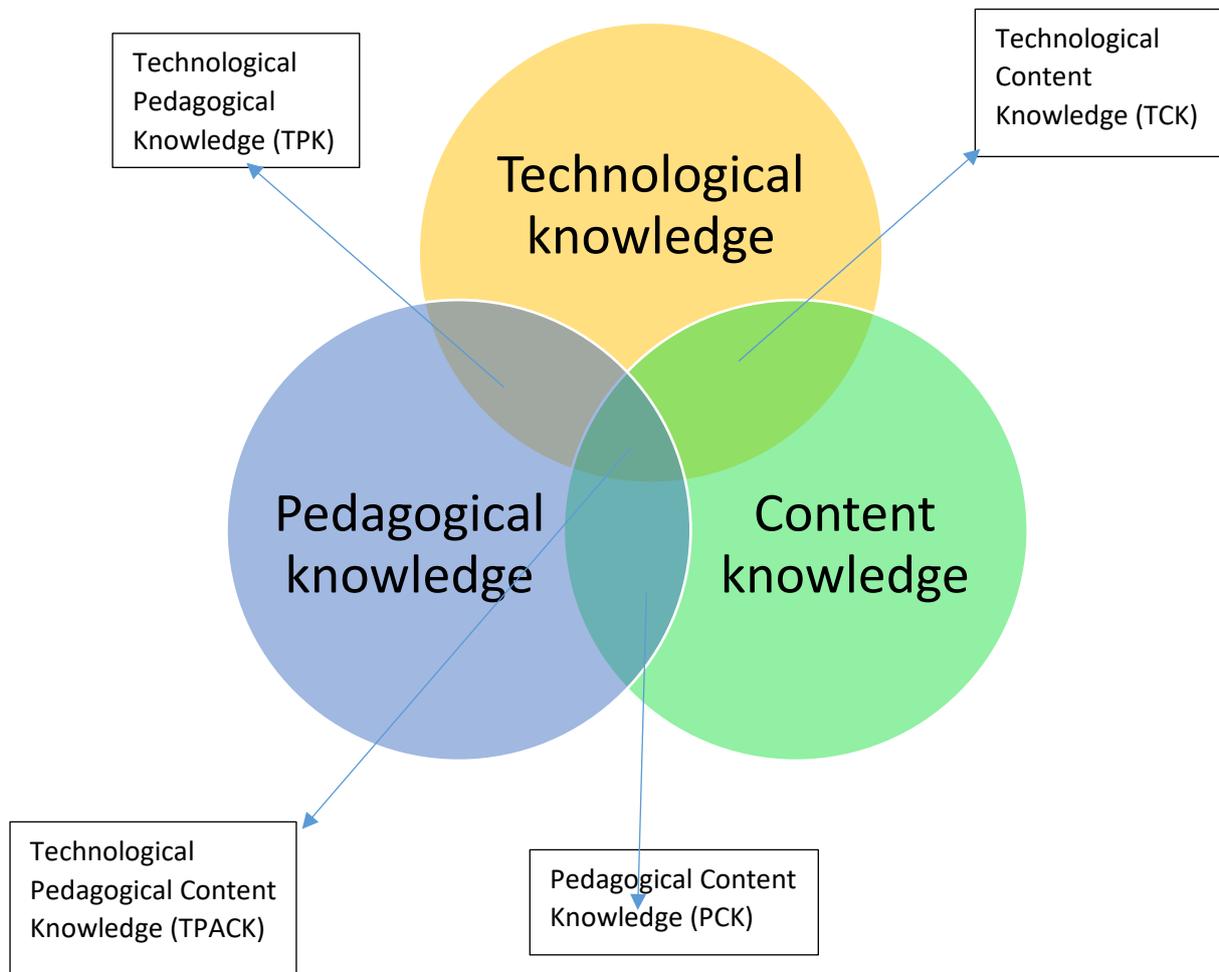
- Content knowledge (CK) which entails the subject matter that is to be taught or learned;
- Pedagogical knowledge (PK) which refers to the methods or practices and the processes of teaching and
- Technology knowledge (TK) which refers to the knowledge about different types of technology (Mishra & Koehler, 2009; Mishra, Kohler & Henriksen, 2014).

Furthermore, the TPACK framework suggests that developing good content requires teachers to interact or intertwines three bodies of knowledge, that is technology, pedagogy and content (as presented in Figure 2, below).

The intersection of these three primary forms of knowledge means that teachers present a deeper level of understanding. TPACK strongly suggests that no one element is more or less important than the others as they are interdependent. The intersection of content and knowledge is key because it distinguishes the knowledge base of teaching.

Mishra, Koehler and Henriksen (2014) further assert that there are six basic principles for effective teaching and learning according to this theory. They include: engaging and motivating, interactive, contextual, reducing cognitive load, scaffolding, and collaboration.

Figure 2.2- Theoretical framework



Source: Mishra & Koehler, 2008

Technology Knowledge (TK): This is the teacher’s knowledge for teaching and enhancing learning using technology. Sahin (2011) refers to TK as the different instructional tools ranging from chalkboards to advanced technologies. The research study by Mishra, Koehler and Henriksen (2014) also refers to TK as both the more advanced technologies and standard technologies. As it was stated earlier in Chapter One even if all the resources were present if teachers were unwilling to use these ICTs for teaching and learning purposes, the resources

would be underutilised in the school. Therefore, teachers' technology understanding and preparedness is key.

For successful ICT implementation in teaching and learning, professional development, improved preparation and the role played by teachers need to be revitalised (The International Conference on ICT and Post-2015, 2015). This suggests that teachers require a clear understanding of the different technological tools and of the subject matter for ICT implementation to be successful. Therefore, TK gives teachers a better understanding of information technology, enables them to identify useful technologies, facilitates them applying these properly for optimal learning, and encourages teachers to continue to adapt to technological changes (Harris, Mishra & Koehler, 2009; Mishra, Kohler & Henriksen, 2014).

Content Knowledge (CK): Many researchers (Mishra & Koehler, 2003; Mishra & Kohler, 2009; Mishra, Kohler & Henriksen, 2014) describe this term as more than information but as encompassing all aspects of a subject, including its principles, concepts, relationships, outstanding issues and methods of inquiry. This is further described by Mishra, Kohler and Henriksen (2014) and Terpstra (2019) as concepts, facts, principles and theories learned or taught in specific academic courses rather than related skills- such as researching, reading and writing that are learned by learners in schools.

Pedagogical Knowledge (PK): This refers to the specialised knowledge (teaching strategies) of teachers for creating effective teaching and learning environments (Mishra, Koehler & Henriksen, 2014) for all learners. This also refers to teachers' instructions and their knowledge on any given subject and curriculum. PK therefore comprises knowledge of classroom management, knowledge of teaching and organisation (Terpstra, 2019), the types of activities encouraging learning, understanding how learners learn and teachers' knowledge of how best learning can be assessed. Previous research (Simelane, 2013; Mishra & Koehler, 2016) has shown that it is important for teachers to acquire the pedagogical skills of using ICT for improvement of the teaching and learning process rather than concentrating on the technical skills of teachers. This means that teachers' use of ICT in different subjects to support teaching and independent learning is valuable for the integration of ICT in schools.

Pedagogical Content Knowledge (PCK): This is pedagogical knowledge (PK) and content knowledge (CK) intertwining as pedagogical content knowledge (PCK). Therefore, PCK is the result of the intersection between content and pedagogy and is based on the specific learning objectives and pedagogical practices used in ICT implementation. According to Graham (2011)

and Rodgers (2018), PCK is about knowing and understanding how best one can use available digital tools to transform or enhance the content, how it is delivered and how learners interact with it. Mishra and Koehler (2009) assert that PCK addresses the gist of the curriculum, teaching, learning, assessment and reporting.

Technological Content Knowledge (TCK): This is an intersection of technology knowledge (TK) and content knowledge (CK) and how they constrain and support each other (Terpstra, 2019). It has been suggested that TCK is related to the use of technology for strengthening the presentation of subject matter (Hooker, 2017).

Technological Pedagogical Knowledge (TPK): This describes the interactions and relationships between specific pedagogical practices (PK) and technological tools (TK). Mishra and Koehler (2009) described TPK as an understanding of how selected technologies used in specific way could enhance the teaching and learning process. This includes knowing the limitations of a range of technological tools and their pedagogical applications (Mishra, Koehler & Henriksen, 2014). A recent study by Terpstra (2019) suggests that TPK is when teachers get to understand how technology reshapes teaching and redefines learning.

Technological Pedagogical and Content Knowledge (TPACK): TPACK is when teachers demonstrate a full understanding of technological concepts (Mofarreh, 2016) and, according to Mishra and Koehler (2008), this is the basis for good teaching with ICTs. This can be further described as knowledge and better understanding of how ICT can be used in the development of new epistemologies or strengthening old ones (Terpstra, 2019). These pedagogical techniques are constructive ways of using technologies in teaching content using learners' prior knowledge and theories of epistemology (Mishra & Koehler, 2008).

TPACK therefore provides a clear overview of how ICT could be implemented in primary schools and enables a balanced and sustainable practice for its implementation. The essence of utilising TPACK as the theoretical framework guiding this study was to investigate how these three bodies or components of knowledge could best be illustrated in a classroom context through the appropriate use of TPACK to achieve the basic principles of ICT integration in the education of learners with diverse disabilities and learning difficulties. The three bodies of knowledge were therefore used in this research (content, technology and pedagogy) to evaluate the proficiency levels of teachers. For successful teaching, teachers need to implement and develop an understanding of the relationship between content and pedagogy (Koehler, et al., 2014). During observation I ascertained and explored, using the basic principles (engaging and

motivating, interaction, contextual factors, reducing cognitive load, scaffolding and collaboration) of TPACK. Moreover, the resulting interaction between the three bodies of knowledge from this theory ought to take into consideration the principles of the interpretive constructivist paradigm. As mentioned, this framework guided this study due to its all-inclusive bodies of knowledge and this enabled a comprehensive understanding of the factors that influence ICT implementation in inclusive primary schools.

2.10 CONCLUSION

The above review of the literature has shown that various factors, as groups of elements or variables that can influence ICT integration in teaching/ learning may be either positive or negative. The factors may also be intrinsic factors such as computer experience and internal support structures or extrinsic factors which are determined by a cluster of variables. These could be skills of learners, resource availability and personal opinions.

Studies relating to the factors influencing ICT implementation in inclusive primary schools in Eswatini have been limited and, according to my knowledge, there have not to date been any studies focusing on ICT implementation in inclusive primary schools in Eswatini. In the next chapter methods on how data was collected from the research sites and thereafter data analyses are discussed.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the methods that were used to collect and analyse the data for this study. Research methods are the ways in which one collects data and how that data is analysed (McMillan & Schumacher, 2011). They further argued that, selecting the right methods and choosing a design that is suitable for a study, is very important for addressing the research problem. Therefore, this section describes the research designs that were used, the size of the sample, sampling methods and the population targeted. This chapter also includes the instruments used, data collection procedures, modes of data analysis and the limitations of this study.

3.2 RESEARCH PARADIGM

A paradigm is a set of beliefs, the premise, values, and practices shared by the research community (Brown & Clarke, 2014). A research study by Guba and Lincoln (2016) describes a paradigm as opinions and notions that are precept.

This study was embedded within the interpretive constructivist paradigm. Interpretive researchers believe that reality relies on the imminent experiences of people and their understanding(s) about the world (McMillan & Schumacher, 2011) and they believe there is no correct or incorrect theory. According to Henning, van Rensburg and Smith (2014) an interpretive researcher does not stand and watch but participates while observing. This research therefore derived its construct from the field by examining the participants in the schools.

A paradigm therefore, is based on ontological, epistemological and methodological assumptions as stated by Guba and Lincoln (2013). The ontological assumption is based on the participants' understanding of the nature of reality and whether there is anything to be known about their understanding of the implementation of ICT in inclusive primary schools. Epistemological assumptions refer to whether and how the researcher could understand and interpret the meanings attached to the research participants because there are many different versions of realities and they are closely linked to the setting in which they occur in order for the researcher to understand how things really are. Lastly, this research used the

methodological assumption, based on the afore-mentioned epistemological assumption as this helped to use the correct methodology.

3.3 RESEARCH DESIGN

A research design is a plan for how the researcher will select the research site, the participants, and all the procedures to be followed during the data collection process (McMillan & Schumacher, 2011) that is aimed at answering the research questions. This study design was a descriptive and interpretive case study where the data collected was analysed using a qualitative approach.

According to Gay (1997), in Simelane (2013), a case study is a strategy for data collection with respect to one or more variables to determine the status of a given population. A case study was further defined by Maree (2016) as a system involving the collection of sufficient information from a social setting, particularly individuals, activity, group or event to give a clear understanding to the researcher while also comprehending how the subjects work. This design was used because it was the most effective way of collecting data for this research. A research design does not only help the researcher to comprehend the reality of the study but also allows the researcher to condense data collected (Flick, 2009 in Mulinge, 2016) to remain focused on the research objectives so that it can be presented accurately.

3.4 RESEARCH APPROACH

The approach used for this study was qualitative. A qualitative study is descriptive and interpretative as ascertained by Young and Ku (2008). This approach emphasises collecting data in naturally occurring surroundings and that the data collected should be in words rather than numbers (McMillan & Schumacher, 2011). The researcher must therefore explore and extensively search for information using different methods for a deeper understanding to be achieved. This study used an inductive research approach to satisfy its aims and objectives. According to Gabriel (2013), an inductive approach is generally associated with qualitative research and many researchers use this approach to study behaviour as it occurs in its natural setting.

I collected data using multi-methods which helped in cross-checking and validating data obtained by using various data collection strategies. Data was collected directly by interviewing

the participants, open-ended questionnaires were administered with the focus on ascertaining their understandings, and observations were conducted to validate the data collected. The meanings were guided by the interpretive constructivist paradigm. This means that this research considered the ontological and epistemological aspect of the subjects because they constructed their own understanding and knowledge about the factors influencing ICT implementation in inclusive schools in the Manzini Region in Eswatini. My perspective and opinions were reflected in the data analysis (Chapter 5) as McMillan and Schumacher (2010) assert that the researcher's perspective and opinions should be reflected in data analysis.

3.5 TARGET POPULATION

Population is defined by McMillan and Schumacher (2011) as a group of individuals from whom the research can be generalised and a sample is the participants or group of individuals who the researcher will use in the data collection process. This study's population comprised two inclusive primary schools in the Manzini Region of Eswatini. This study was conducted in this region which has 37 inclusive primary schools with ICT programmes. There were 43 teachers in both schools (19 and 24 respectively) and two principals.

3.6 RESEARCH SAMPLE AND SAMPLING PROCEDURES

Delport, Fouch, Strydom and De Vos (2016) posit that the qualitative researcher's focal point is often drawn up through purposive selection and it is based on non-statistical methods. Purposive sampling is a sampling technique where a researcher chooses subjects who have the information that the researcher is interested in (Best & Khan, 2006). According to McMillan and Schumacher (2011), purposeful sampling is choosing the participants with the same characteristics. Purposive sampling procedures were used because participants needed to have the information that I was looking for. There were 37 schools implementing ICT in the Manzini Region and in this study, two schools were chosen. A total of 16 participants were selected for this study from the two schools and one of them withdrew from participating. Two teachers from each school were observed, five and four respectively from each school completed questionnaires, and the principal from each school was interviewed. From the teachers who completed open-ended questionnaires, two were from the lower grades (Grade 1-4) and three from the higher grades (Grade 5-7) in each school. Lastly, for the observation one teacher was from the lower grades and another from the higher grades.

3.7 DATA COLLECTION PROCEDURES

This technique allows researchers to obtain information from participants while guaranteeing privacy (Rueda & Arnab, 2016). This section therefore outlines the processes and key considerations that guided me in order to guarantee the safety and privacy of the participants.

3.8 DATA COLLECTION TECHNIQUES

Qualitative researchers are those researchers who seek to obtain information directly from the source either by observation or by interviewing the participants in their natural surroundings (McMillan & Schumacher, 2011). The sources used for collecting data in this research were therefore both primary and secondary sources. Primary sources were individuals with whom I interacted directly through observations, individual interviews and open-ended questionnaires.

This research used triangulation of data collection methods- that is observations, interviews and open-ended questionnaires because the researcher compared different situations, sources, and methods to see whether the same pattern was recurring. Nine teachers (five and four from each school respectively) responded to the open-ended questionnaires; two principals (one from each school) were interviewed individually; and four teachers (two from each school) were observed. Interviews were conducted with the principals, who had the relevant information about the topic of study. The question items were used to gather information from the teachers. Below (Table 3), is a summary of the research methods used in this research and they will be discussed further in the next section.

Table 3.1- Research methods employed

RESEARCH METHODS	PARTICIPANTS
Interview	Two principals (one from each school).
Observation	Four teachers (Two from each school), one from lower primary, and another from higher primary.
Questionnaires	Nine teachers (Five and four from each school)

3.8.1 Interview guide

This study was aimed at gathering in-depth information on ICT implementation in inclusive primary schools. Semi-structured questions were therefore used. Interviews provide in-depth information because one interacts face-to-face with the people (McMillan & Schumacher, 2011). Through interviews, I was able to collect direct and reliable data from the participants. I also affirmed the responses by probing for clarity. The attitudes, feelings and opinions of the participants were therefore exposed in the process. Semi-structured interviews also enabled the respondents the freedom to reveal as much information as possible.

Interviews have high construct validity because I asked the participants further questions where the need for more information arose. The face-to-face interaction between the participants and myself as the interviewer allowed me to gather in-depth insights. Interviews also established a resonance between me and the participants (Nyakowa, 2014). In order to retain the data collected, interviews with the principals were recorded with their permission. I also took some informal notes during the interviews referred to as field notes. Fortunately, none of the participants declined to be recorded but I made notes that were more detailed. I recorded and transcribed data verbatim so that the record could be precise. (See attached interview guide in Appendix A).

3.8.2 Observations

Observation is a strategy of collecting data where the researcher (non-participant observer) hears and sees what is happening naturally in the research site (McMillan & Schumacher, 2010). During the observations, I followed an observation checklist and hence used my senses of sight and hearing for a regulated perception of what was taking place by considering only relevant information as ascertained by Young (2014). I used non-participant observations where I was part of the group but did not participate in the activity being observed. By not participating, I had ample time to use my senses to take note of the data that I was interested in. The observations were carried out in classes where teaching and learning was taking place to find out how learners were being taught using ICT. An observation checklist was used to record data collected during observations. I also assessed the classrooms in order to ascertain whether the classrooms or computer laboratories had adequate learning and teaching materials for ICT.

Four teachers (one in lower primary and another in higher primary from each of the two schools) were observed in a classroom setting during lesson time in order to observe the environment during lessons and how they worked with the learners during an ICT period and how ICT was being integrated. An observation checklist in Appendix C was used to guide this process.

3.8.3 Open-ended Questionnaires

Questionnaires are sets of questions developed for a certain purpose (McMillan & Schumacher, 2011). Young (2014) defined questionnaires as a technique for obtaining data using a list of printed sets of questions that are administered to the participants with the required information. Qualitative question items generate useful and rich material for researchers in many disciplines (Eckerdal & Hagstrom, 2016). The participants provided highly informative material because the answers consist of opinions, experiences and memories. Question items were easy to administer especially to many participants and the data was collected within a short space of time. I administered the questionnaires personally to the participants. Nine teachers (five and four respectively from each school) both male and female (lower primary and higher primary) completed the question items. Open-ended questions were used. I could not be biased because all the participants completed the same question items. It also allowed the participants to be more comfortable as there were no face-to-face interaction with the researcher when they completed the questionnaires (Alharbi, 2014). The question items are attached in Appendix E.

3.9 TRUSTWORTHINESS AND CREDIBILITY

In this research, the trustworthiness, credibility and objectivity of the collected data should be assured. Maree (2016) further argued that trustworthiness and credibility helps with the assessment of the worthiness of the data.

Credibility is one of the key factors in establishing trustworthiness in a research study (Cope 2014). McMillan and Schumacher (2011) defined credibility as the extent to which the results of a study approximate reality and are thus judged to be trustworthy and reasonable. Cope (2014) described credibility as the confidence that the qualitative researcher has in the truth of the research findings. Credibility was further described by Connelly (2016) as the extent to which research findings correspond to the truth. One of the methods used in this study to

establish credibility was triangulation, which ensured that different situations, methods, and sources were used in data collection.

Transferability, according to Polit and Beck (2009) refers to one of the factors required for qualitative research. When the information gathered during the qualitative research changes to a different environment, transferability is possible. Transferability may be enhanced when the researcher conducts an in-depth study and provides a detailed description of the information and the environment. In this study, as a researcher I explained in details how sampling was done, I included participants who were directly involved in using ICT at their schools where; two schools were selected.

Dependability, according to Polit and Beck (2009) refers to the stability of data over time and the situation where dependability in research requires that; the conditions should remain the same. This means that if other researchers conduct the study, the results should be consistent. A further component was described by Maree (2016) as affording participants an opportunity to comment on the data's interpretation, to establish whether the researcher understood the participants' perspectives. In this study, interviews were recorded using an audio recorder to ensure accuracy. In addition, participants in this study were given an opportunity to assess and comment on the research findings when themes that were derived from the data were presented to them.

Conformability refers to the data provided by the participants and whether it was captured verbatim, objectively and accurately. Conformability further specifies the degree to which the results can be validated (Polit & Beck, 2008). The evidence of the results points to conformability, which means it is part of a good qualitative research criterion.

In addition, conformability means participants should be able to verify whether the concluding findings mirror the information they shared (Creswell 2009). This is a precaution for the researcher to be objective. It could also safeguard against biased analysis or against a researcher's own viewpoints (Polit & Beck, 2008) dominating the findings. The availability of the final report gave participants a chance to consider whether the findings matched their views. In this study it dealt with the TPACK of the teachers in Manzini Region.

Authenticity is described by Polit and Beck (2008) as the scope "in which the researchers fairly and faithfully show a range of different realities". Authenticity was guaranteed in this

research during interviews and observations. Participants' voice intonation and body language were also observed to give deeper meaning to their words (Creswell, 2009).

3.10 DATA ANALYSIS

Qualitative data analysis is a systematic procedure of coding, sorting and interpreting data to provide explanations of a single entity of interest (McMillan & Schumacher, 2014). The main aim of data analysis is making sense of the collected data and answering the research question (Savin-Baden & Major 2013; Merriam, 2009).

Every research study starts with the quality of data collected. The data collected from this research was analysed using the inductive approach as follows:

- Data transcription is the process of converting notes and details into a format that will facilitate analysis (McMillan & Schumacher 2014). The data obtained in this study was then transcribed because the data from the field was unstructured. This data was then converted into textual form, using computer-assisted qualitative data analysis.
- The researcher then organised the data by returning to the research objectives or questions to organise the data into themes according to the questions or objectives.
- Data segments contain meaningful bits of data in the form of words, phrases, sentences or paragraphs (McMillian & Schumacher, 2010). In this study, the transcribed data was broken into smaller and more meaningful parts of data and was arranged in a matrix to assist with coding.
- Data coding helped me to compress the data into easily understandable concepts, names and patterns to facilitate the analysis of the data. In this research, all data segments were assigned codes and patterns to help describe them.
- A data category is the grouping of similar codes to form categories (McMillian & Schumacher, 2011). In this study, the related codes were combined and organised into categories.
- Conclusion of data analysis means stating the findings and outcomes based on the research objectives. The data was thereafter presented into a final report.

3.11 Ethical considerations

Ethics is that part of philosophy which deals with the behaviour and conduct of people and guides them in relationships with other people (Akaranga & Makau, 2016). Akaranga and Ongong'a (2013) refer to ethics as the conduct or the way of life that differentiates between acceptable and unacceptable behaviour. Stephens (2013) defined ethics as grounds for making decisions about what good conduct is. Research ethics has well outlined rules and guidelines that describe the behaviour of a researcher (Akaranga & Makau, 2016). Research ethics therefore focuses on what is right and wrong and what is proper and improper from a moral point of view while conducting research.

The rights of the participants were considered throughout the research process and the principles of confidentiality and anonymity were adhered to. This research had a minimal risk to participants and the magnitude of discomfort was not more than any encountered in life during a test or examination.

I was guided by the principles of ethical research as stipulated by the University of South Africa's, Faculty of Education's Guidelines for Ethical Clearance by the Ethics Committee. Ethics Clearance was sought from the University of South Africa using the relevant guidelines and procedures. Letters of Introduction were sent to the school principals together with the permission letter from MoET. Telephone calls were made after a week to ascertain if the schools' principals and teachers were willing to be part of the study. After principals and teachers indicated their willingness to participate in the research, letters were provided to the participants containing full information about the topic of study and the objectives. It was also stated how the research could benefit the education system in Eswatini's Inclusive Primary Schools.

The data was collected through open-ended questionnaires, interviews and observations as stated in Section 1.7.3. I administered the question items in person to the participants in schools and returned to collect the question items. Face-to-face interviews with the principals were recorded during the interview process with their permission. I also observed ICT lessons in the two selected inclusive primary schools guided by an observation checklist.

3.11.1 Consent

Informed consent is described by Simelane (2013) as the process of obtaining the co-operation and consent of the research participants. Informed consent therefore means that the participants must be fully aware of the objectives of the study and how the findings would be used. They

were made aware that their participation was free and voluntarily and they could withdraw their services whenever they may want to. Informed consent was sought from the participants and an explanation of what the research was about was provided to ensure that participation was voluntary. It was explained that their participation would not cause any harm. Akaranga and Makau (2016) asserted that this could be achieved only if the researcher guarantees confidentiality and anonymity for the research participants.

3.12 RESEARCH LIMITATIONS

Research limitations are the shortcomings or flaws which could be the result of too small a sample size, unavailability and flawed methodology (Theofanidis & Fountouki, 2019). According to Olufowote (2017), no study is inclusive of all possible aspects or flawless. This study's limitations were therefore as follows:

- The generalisation of the findings: The findings will only be specific for the participating schools not in any other schools in other regions because there could be other factors that may affect results.
- The sample size of 15 participants is small and a bigger sample would probably heighten the reliability of this research.
- One of the participants withdrew from completing the question items and no reason was given for the withdrawal.

3.13 CONCLUSION

This chapter outlined how this study was embedded within the interpretive constructivist paradigm which is based on the ontological, epistemological and methodological assumptions as stated by Guba and Lincoln (2013). Purposive sampling procedures were applied in two schools in the Manzini Region and 15 participants were selected to collect data. The methods used to collect data were observation, question items and interviews to ensure that different situations, methods and sources were used for data collection to enhance the validity of the study.

This chapter discussed how permission was sought from the ministry of education, schools and participants. How the rights of the participants were considered throughout the research was

discussed as well as how confidentiality and anonymity were adhered to. It has explanations of how the data collected from this research was analysed using the inductive approach. This research however has some limitations such as a small sample size, preventing the generalisation of its findings and has also been discussed. In Chapter 4 the findings of the research are discussed.

CHAPTER 4

DATA ANALYSIS AND PRESENTATION

4.1 INTRODUCTION

This chapter is the presentation of data collected from the field using the methodology and data collection strategies discussed in the previous chapter, that are related to the factors influencing ICT implementation in inclusive primary schools in the Manzini Region in Eswatini. The researcher used A and B for the two schools to ensure anonymity and confidentiality of the research sites. This research used a triangulation of observation, interviews and questionnaires. The data is therefore presented based on these three methods. The data was analysed based on the main research question and the four research sub-questions using themes gathered from the data. To answer the main research question, “what factors influence the implementation of ICT in inclusive schools in Manzini Region in Eswatini?”- research sub-questions were also used, as follows:

- What type of ICT tools are available in the schools for the implementation of ICT?
- What are the teachers’ attitudes towards the implementation of ICT in inclusive primary schools?
- What are the teachers’ proficiency levels for the implementation of ICT in inclusive primary schools in the Manzini Region?
- What challenges are teachers experiencing in the implementation of ICT in inclusive primary schools in the Manzini Region?

4.2 RESPONSE RATE

This study was comprised of 15 participants, made up of two principals who were interviewed, four teachers who were observed in classroom environments and nine teachers who completed questionnaires. The participants were drawn from two inclusive primary schools in the Manzini Region of Eswatini. Table 4.1, below is a summary of the response rate from the three methods that were used to collect data in these schools.

Table 4.1- Response rate

INSTRUMENTS	Number of issued questionnaires	Response rate	Response percentage
Question items	10	9	90%
Observation	4	4	100%
Interviews	2	2	100%

There were ten question items distributed to ten teachers and only one was not completed. Nine question items from nine teachers were fully completed and returned. Interviews received a 100% response rate as both principals were interviewed. Observation also received a 100% response rate because all four teachers purposively selected for the study agreed to be observed.

4.2.1 Open-ended Questionnaires

The researcher administered the question items personally and explained the topic and the objectives of the study to the participants. The importance of the study was also outline to the participants. The question items included open-ended questions on how ICT is implemented within and outside their school setting. These questions were structured to investigate the following, but in no particular order.

- Types of ICT tools available in the school
- Teachers' proficiency levels
- Teachers' attitudes
- Challenges faced by schools in the process of implementing ICT in inclusive primary schools

The researcher left contact details for further questions and comments while they completed the question items. Nine of the ten teachers completed the questionnaires, which resulted in a response rate of 90% (as shown in Table 4.1).

4.2.2 Observations

The researcher personally presented the observation checklist to the teachers in both research sites. After a week, arrangements were made for me to conduct the observations. The classroom observations helped me to observe the interaction of the learners during an ICT class. I observed both the lower and the higher primary classes. In School A observation was conducted in Grades 3 and 6 respectively. In school B, I was permitted to observe Grades 2 and 6 respectively. The response rate was 100%. The observation checklist had five sections, as follows:

- Learning environment
- Availability of materials and resources
- Pedagogy and content presentation
- Teacher's proficiency
- Organisational factors

4.2.3 Interview guide

Lastly, the interviews with the principals also recorded a 100% response rate but one principal declined to be recorded. He however consented to notes being taken during the interview. The interview guide included open-ended questions to guide the interview but varied depending on the attitudes and the responses of the interviewees. They were free to ask questions. The interview guide was organised so as to measure the objectives of the study, although in no particular order.

4.2.4 Section summary

This section indicated the response rate from the participants and how the triangulation of questionnaires, observation and interviews were structured. Table 4.1 summarised the response rate from the participants.

4.3 BACKGROUND INFORMATION

In order to provide a clear picture of the research sites, a brief geographical location of the schools and the teachers' demographic details will be presented.

4.3.1 Research sites' backgrounds

Eswatini is a landlocked country bordered by Mozambique in the East and by South Africa in the West, North and South. It has four administrative regions, namely, Hhohho, Shiselweni, Lubombo and Manzini. Manzini has the highest number of primary schools in the country with 181 as compared to the other regions as indicated in Table 2.1 in Chapter 2. Manzini is the biggest region with a population of 355,945 (2017 census) and it is situated in the central part of the Kingdom of Eswatini as shown in Figure 4.1, below.

Figure 4.1- Districts of Eswatini



The two schools where the research was conducted are both in the Manzini Region. The Eswatini government is the main provider of education and aids (funds and resources) all primary schools except for private schools. Both primary schools are under the same in governance structure. Below, is an example of the different institutions of governance for primary schools as per the AEC Report (2017).

Figure 4.2- Schools by institutional governance

Institutional Governance	Number of primary schools
Community	362
Government	5
Mission Government Aided	215
Private Government Aided	15
Private not Government Aided	27
Total	624

Source: MoET Report, 2017

Both School A and B used in this study are Mission Government-Aided primary schools. They both offer primary education in two phases, namely, lower primary that ranges from Grade 1 to 4 and higher primary ranging from Grade 5 to 7. Both schools are in a semi-urban environment and are inclusive schools. This suggests that they both cater for learners with different educational needs. School A is a day school and School B is a boarding school and both are in the Manzini Region. School A is under the governance of the Anglican Church and School B is governed by the Roman Catholic Church.

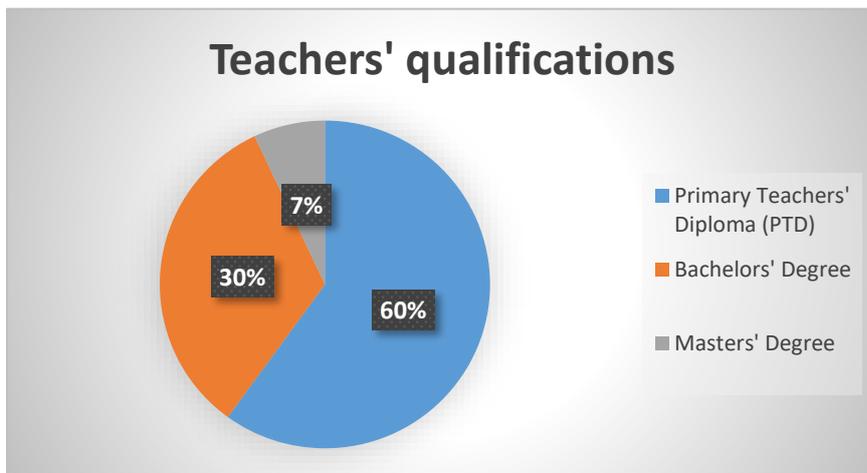
School A uses English as their language of teaching and learning and is amongst the best performing schools in the region. In this school, there are eight subjects offered and the Examination Council of Eswatini (ECE) at Grade 7 level examines the learners. They offer ICT as an additional, stand-alone subject but there is no external examination from the Examination Council of Eswatini. There is one hour allocated for ICT every week. In this school, there were three learners with visual impairment and five with autism. This school is double streaming (two classes per grade) from the first grade to Grade 7. In this research, two classes were observed in School A, one from the lower grade (Grade 3) and the other was a higher-grade class (Grade 6). In the third grade, there were 55 learners and Grade 6 had 43 learners. For confidentiality, the participants observed from School A were coded as OA1 (Grade 3 teacher) and OA2 (Grade 6 teacher). The five teachers who completed questionnaires were QA1, QA2, QA3, QA4 and QA5. The principal for school A was coded as PA.

School B also uses English as their language of teaching and learning and was amongst the average performing schools in the region. It has a large number of learners with diverse disabilities and learning difficulties because they were transferred from other schools within the country. There are also eight subjects offered in this school where there is an external examination administered by ECE. ICT is integrated with the other subjects and is therefore not a stand-alone subject as in the case of School A. This school is also double streaming from Grade 1 to Grade 7. In this school, there were 45 learners who were visually impaired, 11 with physically disabilities and many other learners who were suspected to have autism. Two classes were observed in this school, one from the lower grades (Grade 2) and the other from the higher grades (Grade 6). In Grade 2, there were 62 learners in the class and in Grade 6 there were 57 learners. For School B, the observed teachers were named as OB1 (Grade 6 teacher) and OB2 (Grade 2 teacher). The teachers who participated in completing the questionnaires were QB1, QB2, QB3, QB4 and QB5. The principal for this school were named PB.

4.3.2 Educational level

The findings in Figure 4.3 suggest that all of the participants used in this study had acquired tertiary education that made them able to deliver their services as primary school teachers. It can be deduced that most of the participants acquired tertiary education and ICT implementation cannot be attributed to the participants' level of education. This is mainly because most of them have no ICT training and they only used ICT in college for completing their own assignments not for transmitting knowledge to learners. Thus, most of the participants were reluctant to teach ICT or to use ICT in their teaching. 60%, that is, 9 of the 15 participants had a Diploma in Education, 33% (5 participants) had a Bachelor's Degree and 7% (1 participant) had Master's Degree (as shown in Figure 4.3). However, only a few (7%) had an additional certificate that qualifies them to implement ICT in inclusive primary schools.

Figure 4. 3



4.3.3 Section summary

This section analysed the background of the research schools and the participants' qualifications.

4.4 FINDINGS FROM TEACHERS (QUESTIONNAIRES)

4.4.1 Question 1 - What type of ICT tools are available in the schools for the implementation of ICT?

For successful ICT implementation, implementers should have a clear understanding of what it means. To investigate if the types of ICT in the school influences ICT implementation, I posed some questions to facilitate an understanding of the participants of ICT. All the participants in both School A and B generally seemed to have an understanding of what ICT is.

4.4.1.1 Types of ICT

This study investigated the types of ICT tools available in the schools for ICT implementation and whether they influence ICT implementation. All three research methods contained questions to ascertain the types of ICT available. Here are some of the responses of the teachers in School A:

QA1-There are 12 computers used by learners in the computer laboratory, 4 printers and one projector.

QA2- There are 12 computers, 4 printers that are used by the teachers to do tests for learners and one projector that we use to enlarge text for the partially sighted learners.

Teachers in School A indicated that there was a computer laboratory with 12 computers, 4 printers and one projector. The computer laboratory was used by all learners in School A under supervision of the ICT teachers. Classes (Grades 1-7) took turns and used the computer laboratory during an ICT period or the ICT teachers would go to their normal classrooms to teach about ICT depending on the topic to be learnt. Teachers used the projector to enlarge text for partially sighted learners and print out some of the work using the printers. The computer laboratory was also used by the school secretary and principal for internet connection because there was no internet connection in the office.

This is what teachers in school had to say:

QB2-There is only one computer and printer in the office used by the school secretary and many other ICT tools used by learners in the classrooms depending on their disabilities and learning difficulties.

QB3- computer, printer, braille note touch, white cane, teller frames, a sensory room and projectors.

QB5- There are assistive technology tools such as braille note touch, magnifying glasses, wheel chairs, hearing aid, embossing machine and there are tools in the resource centre of the school.

In School B, there was only one computer used by the school secretary but they had other tools such as printers, braille note touch, white cane, teller frames, a sensory room and projectors. Participants indicated that there was also an embossing machine. There was a resource centre in the school where teachers could obtain information and where they could obtain assistance from trained personnel on the use of assistive devices should they encounter any problems when teaching learners with diverse disabilities and learning difficulties. Moreover, there were some learners with physical disabilities in the school; they used different tools such as hearing aids, wheel chairs and spectacles but these tools were not provided by the school.

When teachers were asked about the learner ratio per ICT tool, their responses were as follows:

QA1- five learners per computer

QB1- every child has his/her tool

QB5- sometimes two children share one tool

All four participants in School A indicated a congestion of five learners per computer whereas in School B, three participants said each child has his/her ICT tool and two said sometimes two learners share one ICT tool. In School A, there was internet connectivity in the computer laboratory while in School B, all participants suggested no internet connectivity for the school.

The results provide evidence that the type of ICT tools present in the school have effects on ICT implementation because teachers have to use different devices to enable enhancement of teaching and learning.

4.4.1.2 ICT maintenance

Another factor in the investigation into what factors had an influence on ICT implementation was the issue of the maintenance of ICT tools in the school. The responses to the question on maintenance were as follows:

SCHOOL A	Participants' responses
QA1	Some teachers do minor repairs otherwise most tools have been lying there idle
QA2	The administration is responsible for maintenance and servicing the tools
QA3	Occasionally a technician is hired by the school to fix all the devices with problems.
QA4	There are authorised teachers who monitor the tools on a daily basis. If I have a problem, I report to those teachers and they know what to do.
PA	The school uses the money collected from parents to fix all problems regarding ICT tools but sometimes we feel the money collected is not enough to cater for all ICT needs in the school.

SCHOOL B	Participants' responses
QB1	Specialists from South Africa are called to update Braille note touch.
QB2	Maintenance is mainly done by the government

QB3	They are serviced once in a year by the government
QB4	Always monitored and serviced by government
QB5	Teachers do minor repairs then report to the office
PB	The government does all the repairing. It is just the late response from the government and yet we need to use the tools. Then teachers find themselves doing some minor repairs.

The findings highlight that there is not much done by the Eswatini government to support ICT implementation programmes in School A, but there is sufficient support from government in School B. This suggests that the maintenance of ICT tools is another factor that can influence ICT implementation in schools.

4.4. 1.3 ICT for inclusion

As it was alluded to in Chapter 2, ICT is also regarded as the tools that encourage inclusion in mainstream schools in Eswatini. Participants use the available tools to accommodate all learners irrespective of their different styles of learning. For inclusion to be made possible, it is vital for all stakeholders and implementers to understand how ICT tools could be used so that they make informed choices during classroom practices when dealing with diversity.

The way in which one understands ICT for inclusion will determine the way it is implemented in teaching and learning. The approaches that teachers applied in teaching are based on their own experiences (Sahin, 2011). Most of the learners with diverse disabilities and learning difficulties are identified at school level by schools but some may have been diagnosed by health professionals (AEC, 2017). Some of these cases include learners with autism, short sighted, learning disabilities and hearing problems. The teachers then decided on how the learners could be accommodated in the mainstream schools using technological tools available to enhance the learning of learners with diverse disabilities and learning difficulties.

Participants were asked if they use ICT for inclusion in the schools. The participants showed a very good understanding that ICT tools should help in the creation of a less restrictive environment and the reduction of barriers to learning. All four participants in School A also indicated that there was not enough done by all stakeholders (the government, MoET and

school administrators) in making sure that ICT is used for the enhancement of the education of learners with diverse disabilities and learning difficulties. Here are some examples of their responses:

QA1: The preparation of resources in primary education should consider the individual learning needs. However, the computer system was not at its best because it was fully dependent on parents' support. The government has little or no support at all towards ICT in inclusive primary schools.

QA2: Yes, we use ICT to accommodate and enhance learning but the tools are not enough for all the learners in the school.

QA3: The ICT programme is not taken seriously by stakeholders in the country because as teachers we do what we can but if we do not nobody cares about that. As a result, some parents do not pay for the ICT programme and teachers do not have instruments to deal with such situations.

QA4: the poor management of ICT is caused by the lack of support from government.

In contrast, participants in School B, indicated that they used ICT tools for inclusion as they had a number of learners with diverse disabilities and learning difficulties in the school.

QB3 Books are loaded in children's braille note touch so that they may have access to information easily

QB5 Learners with visual impairments are using the jaws programme and can access all textbooks in the braille note touch.

These findings suggest that the participants' willingness to use ICT tools for inclusion was good but the lack of facilities in the schools was demotivating. The lack of ICT resources was identified as another hindrance to ICT implementation in inclusive primary schools in Eswatini. The findings also revealed that participants shared the same sentiments as they suggested inadequate time to learn and teach as an additional factor preventing effective ICT implementation in inclusive primary schools.

4.4.2 Question 2: What are the teachers' attitudes towards the implementation of ICT in inclusive schools?

4.4.2.1 Teachers' attitudes towards the implementation of ICT

For a successful ICT implementation programme in schools, there must be strategies to provide for the implementation of ICT in educational activities in keeping with developing trends and standards. Meenaskshi (2013) ascertained that there were unavoidable facts for successful ICT implementation, including that teachers should be the main initiators and motivators of ICT implementation in schools. It is still believed by many researchers (Hennessy & Onguko, 2010; Ilomaki, 2008; Mahat et al, 2012 and Mndzebele, 2013) that teachers' attitudes and beliefs have a major significance and influence in the implementation of ICT. Moreover, teachers need to recognise that each learner is unique and differs in their involvement, behaviours, needs, abilities, and in the way they perceive things in and outside the learning environment (Acarindex, Modupe & Balogun, 2011). Some questions were therefore asked to measure the attitudes of the participants towards ICT implementation.

4.4.2.2 Factors influencing attitudes of teachers

As ascertained by Gikundi (2016) that there are many factors that can influence the attitudes of teachers in a positive and negative way such as a lack of skill and training. He was further echoed by Halverson (2018) that leadership and the availability of technological tools could also influence teachers in a positive or negative way.

QA1: If I had another option, I would stop implementing ICT because you become enemy number one with the administration especially when you try to request the money allocated for ICT, then we are left with no option but to try implementing ICT without the necessary equipment. If the government can give financial support to all the primary schools implementing ICT maybe it can be better.

QA2: I enjoy implementing ICT but there are many challenges in the process. I would encourage other schools to implement it, as we are the only school around implementing ICT. Therefore, the numbers overwhelm us because parents want learners to do ICT maybe that can evenly distribute the learners to other schools.

QA3: I do not really like teaching that component because it is very demanding and there is not enough material yet one is expected to teach amidst all the challenges. I would encourage other schools to implement ICT for the benefits of the learners.

QA4: ICT teachers are not remunerated in this country. As you can see, I do other subjects so that I can be in the government pay roll. I teach Agriculture and was trained for ICT by the school and there is no release time to prepare for other lessons.

From the four participants who completed questionnaires in School A, one of them indicated that they liked implementing ICT because of an external factor such as a salary but that there were insufficient teaching materials and inadequate support from both the administration and the MoET.

In School B however, participants had different opinions with two participants indicating that they enjoyed implementing ICT. Some of them were not comfortable when it comes to ICT integration as this was not as easy as they had expected, saying:

QB1: ICT should start with the matter of training teachers and administrators. ICT is now used globally so because of the demand in the outside world, it definitely influences that it be used in all schools.

QB2: All schools should be encouraged to implement ICT because we have to adapt to the fast-changing world as teachers. However, we need to have enough personal experience in ICT and have knowledge and skills in teaching and learning with diverse disabilities.

QB3: The government should use the schools already implementing ICT as pilot schools so that some problems can be eradicated before encouraging all schools. Teachers specifically trained with assistive devices be employed or in servicing all teachers in the school.

QB4: The schools should be provided with internet connections. We do not have the necessary knowledge and skills to use ICT in the classrooms. I would encourage the government to start with the training of teachers before schools start to implement ICT.

QB5: It is not an easy task especially without proper training. Teachers should be well equipped with ICT skills and knowledge before implementing ICT. The government should also look at the issue of how time can be utilised to accommodate diversity because there is not enough time.

The data obtained revealed that teachers' attitudes diverge from very positive to negative due to a number of intrinsic and extrinsic factors. Some questions were asked to investigate the experiences of participants in implementing ICT in teaching and learning and to establish whether they would encourage other schools to implement ICT. The responses from the

participants indicate there were intrinsic factors (age, pedagogy and a lack of knowledge) and extrinsic factors (insufficient learning materials, huge enrollments, a lack of time and technical support) that influence the attitudes of teachers towards ICT implementation in inclusive primary schools. There were those participants who developed negative attitudes towards ICT use, mainly due to a lack of knowledge and insufficient tools- Three of the participants in School B indicated that it was not easy to integrate ICT into teaching and learning because of the lack of time and the different learning needs of learners in the school. Two participants indicated increased workload as another factor that influenced teachers' attitudes

4.4.2.3 ICT training

The lack of training of teachers is viewed by many researchers (Bhebhe & Maphosa, 2018; Mndzebele, 2013, Simelane, 2013) as one of the major impediments towards the implementation of ICT in Eswatini primary schools.

Most (four) of the participants in the study in School B attributed the negative attitudes towards ICT to the lack of training and skills. The teachers were not well capacitated but were expected to use and implement ICT successfully. Teachers were not trained for using assistive devices. The table below is a summary of all the participants in this study in ICT education.

Table 4.3

TEACHERS	ICT TRAINING	PERCENTAGE
9 completed questionnaires	3	33%
2 Principals	0	0%
4 observation	2	50%

Table 4.3 (above) shows that most of the teachers implementing ICT did not receive any training yet they were expected to be part of ICT implementation in inclusive primary schools. From the participants who responded to questionnaires, the results show that only 33% received ICT training and the remaining 67% did not receive any training. The participants observed demonstrated that 50% received training and the other 50% did not receive ICT training. When participants were asked how they were trained in ICT, different responses emerged from those who received training.

QA3: I did a course on ICT in Education when I was doing my Degree.

QB2: I attended some presentation on how to use a computer, which was organised by our teachers' union (Eswatini Teachers' Union).

The results indicate that the participants have knowledge of ICT but were not trained in how to implement ICT in teaching and learning to enhance and accommodate diversity in the classroom.

4.4.3 Question 3: What are the teachers' proficiency levels to implement ICT in inclusive schools?

For effective ICT implementation and sustainability, administrators and teachers must be competent in the use of technology. This means that they must have a wide technical understanding, financial administration, social and curricular aspect in ICT education and its use in teaching and learning. As it was argued by Alshmrany and Wilkinson (2017) one of the major challenges in ICT implementation in primary schools is the lack of training for teachers implementing ICT.

4.4.3.1 Teacher competencies

When asked if they were competent and well capacitated for teaching ICT, most of the participants said that they were not sufficiently skilled. They also stated that there were many demotivating factors within the system. Some of them did not receive training and yet were expected to implement ICT. Table 4.5 (above) summarised the teachers' efficiency level as far as ICT integration is concerned. It was also discovered that it was not easy for teachers to adopt new trends of teaching and learning using ICTs. In School A, they revealed that they do not have ICT books in school and sufficient ICT tools to cater for all learners. Teachers have to sacrifice to obtain ICT books and other learning materials to support learning.

QA1: The programme called 'One Laptop per Child' has never helped and they have written countless letters to them but did not have any response.

Apart from that, the school needs other modern technological equipment in order to implement ICT effectively in teaching and learning. For instance,

QA3: ...while choosing a resource for a learner with visual impairment, experience and prior knowledge would be useful to identify the specific need. This is because when we choose resources, we are guided by the specific learning objectives to be achieved. Most of the tools are not there in our schools.

In School B, there were two trained teachers. These teachers were braille specialists and they were used as resource teachers by the school. All the teachers in the school were implementing ICT by using assistive technologies without the necessary skills and knowledge.

The findings indicate that teachers' proficiency level in content, pedagogy and technology knowledge has a fundamental role in ICT implementation in schools. If teachers lacked the three bodies of knowledge (TPACK), they become a hindrance in ICT implementation in inclusive schools.

4.4.3.2 ICT use by the teachers

As ascertained by Bhebhe and Maphosa (2018); Gikundi (2016) and Tonui et al (2016) teachers use ICT for many reasons such as research, communication and social media. They rarely use ICT to enhance teaching/ learning because of a lack of resources. Below are some of their responses:

QA1: I use ICT to prepare teaching and learning materials because the tools are not enough so it is impractical to integrate ICT in teaching.

QA2: I use ICT for research, preparing learning materials and social media for communication. We sometimes use the projector to enlarge text for partially sighted learners.

QB2: I use ICT for teaching and learning because there are many learners with diverse disabilities in my class but I was not trained to use assistive devices. I also use technology for communication.

QB5: Embossing learners work' enlarging text for partially sighted learners, changing text to braille and communication...

Most of the participants revealed that they were not well trained and skilled in the field of ICT but they did find ICT useful in many ways in inclusive primary schools. In School A, ICT was not implemented in all the subjects but was used as a resource for preparing teaching and learning materials. Teachers also used ICT to enhance learning for partially sighted learners. In both schools, teachers were using ICT for communicating. In School B, ICT was used by

participants for braille lessons, embossing learners' work, enlarging text for partially sighted learners and changing text to braille. ICT was also used for communication within the school premises.

4.4.3.3 How ICT was implemented by schools

When asked how ICT was implemented in the schools, all four participants in School A stated that they used the basic methods of teaching like they do in other subjects like English. These are oral discourse based and the observation-based approaches other than activity-based approaches, for instance, some of the participants had this to say,

QA3: There is no difference between the methods used to teach ICT and those for other subjects like English and Mathematics. For the ICT learners, we are supposed to use the activity-based approach.

QA4: I use the discussion method to teach ICT that makes it very easy for me as a teacher because some of the learners have a lot of information. We first start with the simple things in order to suit their level. If there is a pupil from private schools in class, she or he normally does better than our own. I use the discussion-based strategy when implementing ICT.

QB1: ICT is always a way of communicating and we cannot teach without tools such a braille note touch because we have many learners with diverse disabilities.

However, participants in School B asserted that they use an integrated approach due to the number of learners with diverse disabilities and learning difficulties in their classes. They were forced to use ICT to accommodate all the different needs of learners because learning was not possible without ICT as they had a number of learners with disabilities in the school.

4.4.3.4 ICT contribution to teachers and learners

This study's investigation revealed that there are also positive factors influencing ICT implementation in schools. Participants argued that ICT is a very important component of inclusion in many ways but it also varies in how it is handled by implementers and all stakeholders. ICT tools could lie idle if nobody is interested in its use and thus it would not facilitate the learning process as suggested by Eireann (2015). Participants revealed that everybody in the education structure has to recognise and respect the differences among all

learners in an inclusive classroom. This should include giving support to all learners, teachers and the education system as a whole so that the full range of learning needs could be met.

Participants indicated that there were many benefits attained through ICT implementation in schools. It was further revealed by participants that ICT could influence how learners learn and how they are taught as the processes are changing from being teacher centred to learner driven. Participants further asserted that ICT enhances inclusion and it has made work easier for both teachers and learners. It was also indicated that ICT increases participation in learning and cultivates interest.

Participants however blamed the lack of support from the government and school administration as a major hindrance and a contributing factor to the poor utilisation of the ICT tools. Some of the participants reported that,

QB3: The administrators (at all levels) do not give us the professional or social support that we need. We do not attend refresher courses in order to keep abreast with the latest teaching techniques. There are no in-house trainings that have ever been organised at school or district level. ICT teachers have not been sponsored to go for further studies. They do not buy the needed material for teaching or learning.

QA1 who had been teaching ICT in the last five years associated the delayed ICT implementation with the fact that there was no examination. He had this to say:

The MoET should be requested to provide an external examination for ICT in primary schools just like in the other subjects. The MoET at regional level has been asked to modify the syllabus in order to suit the Emaswatis' need.

4.4.3.5 Support for inclusion

The MoET in Eswatini is promoting inclusive education. As revealed by the Eswatini government report (2017) most of the learners with diverse disabilities and learning difficulties drop out of school and do not enter secondary education because they lack support from their teachers.

QA1: There is no support from the government or any other organisation. The only support we get is from the parents as they are the ones funding the programme in the school. If there could

QA3: *We find it hard to support some the learners with diverse disabilities and learning difficulties because there is no support from the government. There is no collaboration between the administration and ICT teachers. Whenever we request money to support the ICT programme in the school, we are always told there was no money in the school.*

QB3: *We need health care workers in the school to help us when learners have health challenges like the learners with autism and those with epilepsy. They can also take care of learners in the sensory room.*

QB4: *We need professionals who can help reduce our workload as we are expected to use assistive devices and yet we are not trained. Sometimes were have to fix some technologies and we are not qualified to do that.*

QB5: *We need professionals to help with ICT maintenance and also support from the government that will sustain ICT tools in the school*

Participants in both schools believed that, if they could be given support, it would be easy to embrace learners’ diversity in teaching. The participants therefore recommended the following support from both government and school administrators, grouped into professional support and organisational support as presented in Table 4.4, below.

SUPPORT	CATEGORIES
Professional support	<ul style="list-style-type: none"> • Teachers need to work with professionals to reduce the work load during the teaching and learning process e.g using braille • The lack of support for learners because some parents need to hire therapists for learners but there is a lack of resources. • Teachers need health care experts for some learners with special needs to take care of them in sensory rooms in the schools.

Organisational support	<ul style="list-style-type: none"> • Teachers need to work together with and the administration of the school fully in support of their efforts • The lack of trained and skilled individuals in the field of ICT yet the expectations were too high. • There are limited resources that result in dysfunctional ICT tools.
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Table 4.4

The findings revealed that the lack of both organisational and professional support have an impact and influence in ICT implementation in inclusive schools in Eswatini.

4.4.4 Question 4: What are the challenges experienced by teachers in the implementation of ICT in inclusive primary schools?

The early stages of development of a new system are crucial to its success (Mott & Leeming, 2013). This means that if inadequate analysis was done, there would be an inadequate understanding of the programme and both teachers and learners could miss some important aspects required for the successful ICT implementation in inclusive classrooms. Teachers could potentially be misunderstood as anti-progressive (Al-Sulaimani, 2010). ICT in inclusive primary schools is still a new phenomenon, which is yet to be fully harnessed by teachers and government. As it was revealed previously (Chapter 2) only 37 schools in the entire country have integrated ICT in teaching and learning. Despite the limited number of schools implementing ICT in Eswatini, the MoET stated that the school is the only social safety net to prepare learners for the 4IR. MoET further drafted ICT policies and encouraged schools to use ICT in teaching/ learning.

Ten years after King Mswati III (2010) highlighted the need for the Kingdom of Eswatini to attain first world status by the year 2022 there are still many impediments to ICT implementation in inclusive primary schools. This study revealed how several factors affect the implementation of ICT in inclusive primary schools in Eswatini, for example, teachers need adequate resources and support from all stakeholders in education. Most of the teachers who

participated in this research study indicated that they lack professional, technical and organisational support.

4.4.4.1 Professional challenges

The lack of skills and training was the first impediment to effective ICT implementation in inclusive primary schools. Participants expressed the need to be trained and to be introduced to using different ICT tools such as computers, white boards, projectors, digital cameras and assistive technologies. As suggested by Tonui, Kerich and Koross (2016), training should not focus only on ICT teachers but all teachers in the school because teachers need to keep abreast of the fast changing world of technology. Some of the participants (as illustrated in Table 4.5) did not receive any ICT training. When asked how ICT could best be implemented in inclusive primary schools, the following were their responses:

QB1: It should start with the training of teachers and administrators then ICT can be piloted in some schools before being implemented in all primary schools.

QB2: There is a need for enough personal experience and knowledge in assistive devices by all primary school teachers so that we can successfully enhance teaching and learning for all learners even those with diverse disabilities in schools using ICT.

Some participants viewed the lack of support from the government as another demotivating issue towards ICT implementation in inclusive schools. When further responding to how ICT could best be implemented, some of them said,

QA2: We need services of specially trained professionals help us to handle learners with diverse disabilities and learning difficulties for successful teaching and learning.

QA3: The government should introduce assistive devices courses to bring teachers abreast of these devices before they could expect us to enhance the education of learners with diverse disabilities in class.

QB3: What stresses teachers the most is the lack of technical support and this may affect the adoption and teachers' willingness towards ICT implementation.

4.4.4.2 Organisational challenges

Some of the participants highlighted organisational challenges as major impediments towards the successful implementation of ICT in inclusive schools. The inability to create an inclusive

learning environment, the lack of time and collaboration were other challenges that were presented by the participants in both schools, as indicated below:

QA2: There must be collaboration between teachers and the office for the success of this programme in schools. The administrators do not want to use the money allocated for ICT.

QA4: All teachers in schools should be part of this programme to ease the workload of the ICT trained teacher. There should also be a clear line of communication between all stakeholders, aligned with what is happening at ground level.

QB2: The recreation of inclusive environments in schools should be a priority by the government and school administrators. Learners with diverse disability are not well accommodated because the teaching and learning, and the curriculum itself, are not inclusive.

Approximately 80% of the participants in this study thought learners were not given enough time to use ICT in the school. Even though there was a genuine need for some teachers to use ICTs in teaching and learning, the time allocated to ICT was not sufficient. Hence, the lack of time required for the successful implementation of technologies in the curriculum was a recurring issue, as indicated by the responses below:

QA1: The time allocated for ICT lessons is not enough especially when they are doing practical lessons. The learners need time to practice using computers.

QA2: The release time for teachers is important because teachers need time to prepare for ICT lessons so taking ICT with other subjects puts a lot of pressure on us.

QA3: Some of the learners are admitted from other neighbouring schools with no ICT background and we are expected to teach them within the time allocated for ICT.

QB1: Teaching and learning in inclusive classrooms is not easy because there are a number of learners with diverse disabilities and learning difficulties. Handling all the learners in one classroom is nothing but close to impossible because of time.

QB4: Time allocated for lessons is not enough to accommodate learners with diverse disabilities together with the normal learners. This is mainly because some of the devices are not in a good condition and you have to keep checking them, so time is lost in that process.

QB5: We need time to practice and check all the assistive devices before using them in class but the workload and the number of learners in class overwhelms us.

Participants felt that adaptation is another problem because of the lack of time. They felt that learners did not have enough time and opportunities to practice ICT usage in their classes. The participants indicated that a significant hindrance to them using ICTs in inclusive classrooms and preparing materials to use in their lessons was the lack of time for proper preparation.

4.4.4.3 Technical challenges

Many of the participants lamented the lack of technical support and internet connectivity in the schools as another major challenge to effective ICT implementation. They further argued that the internet could help with research during class work as it had the potential to improve the learners' independent thinking and their ability to find information on their own.

QA3: The schools should be provided with internet so that teachers can help learners to research during lessons because the learners have different ICT backgrounds, some of their parents do not even have cellphones.

QB5: The government should provide schools with technical support. The role of technical support staff is to monitor and ensure reliability especially concerning technology in classrooms.

QA1: The ICT tools are not well maintained by the schools and that results in some of them being dysfunctional.

QB4: The government and the administration are not acting promptly to ICT challenges faced by teachers. You report a device and it will take some weeks or even months to be fixed.

There was also a major concern regarding teachers' salaries, as can be seen below:

QA1: Government did not pay ICT teachers so we have to increase our workloads by taking ICT along with other subjects.

QB3: Teachers are not paid for the extra work they do.

4.4.5 Section summary

The participants who took part in the study shared their views on the implementation of ICT in inclusive primary schools. It could be ascertained that the limited availability of ICT tools, teachers' attitudes, the lack of time and collaboration and low efficiency levels of teachers all had a major influence on the implementation of ICT in inclusive primary schools. Participants also revealed their dissatisfaction with the manner in which the government handled the implementation of ICT, especially the lack of technical support for the optimal use and maintenance of assistive devices in order to ensure inclusivity in all primary schools.

4.5 FINDINGS FROM PRINCIPALS (INTERVIEWS)

4.5.1 Types of ICT tools

To check the level of understanding from the principals about ICT, a question was asked "What is your understanding of ICT?". This is what the principals had to say:

PB: ICT is an umbrella word for all the tools and devices that make our lives easier and better such as cellphones, cars, computers, braille, eyeglasses, and wheelchairs just to name a few.

PA: ICT as anything that is computer related like cellphones, printers, software, projectors and assistive devices.

Both principals had a clear understanding of what ICT is and how ICT implementation could enhance the teaching and learning of learners with diverse disabilities and learning challenges. It was also evident from their responses that they had a clear understanding that ICT could be used to accommodate diversity in inclusive schools.

PA indicated similar perspectives as those of the teachers. The school had 12 computers, 4 printers and one projector in the computer laboratory. There was also another computer in the office used by the secretary to prepare the tests set by the teachers and for administrative work for the school. He was quick to indicate that the ICT tools available were not sufficient to enhance teaching and learning for all learners.

"As you have seen for yourself, learners are sharing the devices in groups which is not good and there is an influx of learners every year. We have to increase accessibility of the tools but we cannot because of finances."

He further argued that some computers were dysfunctional and awaiting repairs but noted that there was not enough money to do so. The school laboratory was fully dependent on parents as each learner was requested to pay E350 per year to sustain the ICT programme.

PB revealed that they had support from the government, donors and NGOs in the country. He further revealed that the support was because they had more than a hundred learners living with disabilities in the school. Therefore, some of the tools were adequate such as the hand magnifying glasses but others were not. Below is a breakdown of the ICT tools present in the school as recorded in the school inventory.

Table 4.5

ICT tools in the school	QUANTITY	USES
Braille touch note	30	Used by learners with visual impairment.
Projector with camera	15	Learners with partial visual impairment.
Computer software jaws	5	They are used to record the teacher's voice for learners who are blind.
Electric magnifying machine	1	Note taking for partially blind learners.
Hand magnifying glass	33	Magnify learners' notes and they take these home with them.
Braille Thermoform machine	1	To photocopy and print braille
Braille Embosser	1	To transcribe books to braille

The findings from the interviews with the principals indicated that the ICT tools present in the schools had a major influence on ICT implementation. It can be deduced that insufficient funding from government was a huge hindrance to ICT implementation in inclusive primary schools. As both principals indicated, there were not sufficient ICT materials for effective implementation.

4.5.2 ICT maintenance and support

In School A, the principal indicated that parents do support the ICT programme in the school as they agreed to pay a sum of E350 to support the programme. The schools saw an influx of learners in recent years probably because of ICT implementation and Free Primary Education. Most parents wanted their children to be introduced to different technologies at a young age as the world is changing rapidly from teacher-based to technology-based methods of teaching and learning.

The principal in School B indicated that both the government and the school were responsible for the maintenance of their ICT tools. He further revealed that they sometimes also receive support from NGOs in the country. The government however does not always respond promptly to their requests, for example:

PB: We had a technical problem with some braille note touch and it took about 2 weeks for a technical support person from government to arrive at the school. The problem is that the learners will then be forced to share such tools which is not effective at all. Sometimes we are forced to hire technical staff for fixing and repairs.

4.5.3 Teachers' attitudes

When asked what their opinions were concerning the attitude of the teachers towards ICT related work, the principals made the following comments:

PA: Teachers are always complaining but we are in this together. I sometimes feel the pressures if some of the devices are not working. The attitudes of teachers are both negative and positive. A majority of teachers have positive attitudes but there those few who have negative attitudes.

PB: The teachers have to double their effort. Some of the teachers had a negative attitude towards their work. That was why they leave their core business to do private work. There is a need for a change in attitude otherwise; ICT should be integrated in the learning process specially to accommodate learners' different learning styles.

The principals argued that the teachers trained for implementing ICT did not prepare their lessons properly because they were preoccupied with their personal business ventures, for

instance, they also taught in private schools and in some learners' homes. Other teachers were constantly attending local and international conferences at the expense of the learners.

PB: Generally, teachers have positive attitudes to the use of ICTs in inclusive classrooms. Teachers are aware that learners' diversity such as those with autism can be supported using ICT.

Both principals displayed positive attitudes towards ICT implementation in the schools except in relation to the challenges faced in schools implementing ICT such as teachers' increased workload and insufficient and properly functioning tools. They also revealed that there was a lot of pressure from teachers if the devices were not working properly.

4.5.4 ICT programme in primary schools

The principal (PA) revealed that there was a syllabus provided by the Eswatini government to be followed by all schools implementing ICT. The only problem is that there was no formal examination provided by the Examination Council of Eswatini in Grade 7 but teachers should prepare these for their learners as they had a properly structured syllabus. PA indicated that ICTs are very important in the education of learners in primary school. He said:

PA: Today's generation has lost the reading culture. Technology, particularly the television and the computer has replaced the books that the older generation used to read. They would rather listen or dance to music than read an academic book. Alternatively, they would watch a movie in their leisure time than watch an academic programme. Any child who cannot read cannot write either.

Below are the topics learners have to cover from Grade 1-7. Table 4.6 shows the level at which different pupils began studying ICT and the key concepts studied in each grade.

Table 4.6

Level of learners	Topic and Content	Time allocation/ Number of periods per year
Grade 1	Uses of computers, rules and safety precautions	28 periods

Grade 2	Navigating computer systems, ICT literacy, document production and drawings	28 periods
Grade 3	Rules and requirements for the computer laboratory, basic computer systems, navigating computer systems and document production	30 periods
Grade 4	Evolution of computers, computer systems, keyboarding, file management and turtle graphics	30 periods
Grade 5	Navigating computer systems and applications, auxiliary keys, shorts cuts, classification of computers and uses of ICT, page layout, graphics in documents and ethics	44 periods
Grade 6	Computer systems, introduction to computers, classification of networks, emails, social networks, document production, data manipulation and presentation authoring.	54 periods
Grade 7	Data manipulation, introduction to programming languages, document production, and publishing applications.	54 periods

Interestingly, Simelane (2014) indicated that ICT is vital in the education of primary school learners because it enables the searching for information needed and organising of information found. Bhembe and Maphosa (2016) further argued that ICT implementation in inclusive primary schools could help learners as they progress through the different levels of education because it increases responsibility for their own learning. It is also important to familiarise primary school learners with ICTs at an early stage, because the skills acquired would be of great use as they further their education and in adult life.

The findings from the syllabus in Table 4.4 indicate that the number of periods increase as the standards increase to accommodate the curriculum allocated for that class. Each period is 30 minutes long. However, the table indicates that learners start to use a computer in Grade 3. They start learning about the advantages and disadvantages of social networks in Grade 6 which may be too late because learners start to use social media as early as when they are 5-years old or even earlier.

4.5.5 ICT for Inclusion

The principals indicated that ICTs are effective tools for enhancing primary school education. When asked about the issue of time, they both concurred with the teachers that time is a problem when it comes to ICT implementation, as indicated below:

PA: Time will never be enough because there are six core subjects and other schools have two more subjects from the practical subjects but in this school, we have nine subjects. We have the same time stipulation for primary school so we need to make adjustments as we try to implement ICT.

PB: Time is a very big problem but it all comes down to commitment. Teachers need to commit but we have a problem with high school teachers being posted to teach in primary schools. They do not show commitment. A teacher can sacrifice his/her time to help learners because the subject allocated time is not enough.

Both principals agreed that the lack of time is a factor that could hinder effective ICT implementation in schools. The results also indicate that both principals felt the government would need to do more to enable sustainable ICT implementation. PA stated that he had not been teaching for a long time but mentioned that a better method of implementing ICT would be using a guided approach.

In School B, the approach of implementing ICT was very different from that of School A. In School B they use an integrated approach whereby ICT is used in all the subjects to enhance the learning process. There are also assistive devices that are used by teachers in School B to accommodate learners with diverse disabilities and learning difficulties as presented in Section 4.3.

4.5.6 Adapting to change

The acceptance of change and allowing ICT integration from both teachers and administrators is key for effective ICT implementation in schools. In this research, I posed a question related to how the principals understood ICT implementation in their schools. The principals stated that, despite the efforts to provide primary schools with technological tools such as computers, in the case of many schools in the country, ICTs that could aid teaching/learning were hardly in use. This may be due to some intrinsic and extrinsic factors related to the school's administration and the regional department of education. The findings indicated that both principals interviewed for this study had not received any ICT training and they were fully dependent on the teachers and school secretary for ICT implementation.

The principals had a lack of confidence in ICT usage because they lacked the skills, but they had a positive attitude towards its use. The principals' attitude was key in ICT implementation because he could encourage teacher training and equip the schools with sufficient computers and other devices. The principals could also ensure that the teachers have access to relevant technologies, including software and technical support.

Table 4.7 Factors influencing principal's adaptation to change

Category	Frequency	Response rate
Lack of skills	2	100%
Lack of self-confidence	1	50%
More responsibility	2	100%
Lack of support from government	1	50%
Lack of security	2	100%

Lack of skills: The results revealed that both principals lacked the skills for technology as they were unwilling to use it themselves however, they were supportive towards teachers and learners using ICT in inclusive schools. They indicated that many of the learners with diverse disabilities and learning difficulties left school before they reached Grade 7 because of grade repetition and becoming too old to still be in primary school. They argued that they lacked adequate support from the current system and curriculum.

Lack of self-confidence: One of the principals indicated that he was not confident to use ICTs because he had not undergone any training. The principals indicated that they were born before technology and therefore, it was not an easy task for them to adapt to it.

More responsibility: The principals indicated that much responsibility accompanies ICT implementation in inclusive schools and they already had many other responsibilities in managing their schools.

Lack of support from government: One of the principals complained about the lack of support from the government and explained that he had written many letters asking for support but these efforts had all been in vain. This was because very few learners with diverse disabilities and learning difficulties had been diagnosed by health professionals as teachers had identified their challenges and barriers to learning. The other principal had adequate support from the government due to the large number of learners with diverse disabilities and learning difficulties formally enrolled in the school.

Lack of security: As indicated in Table 4.6, both principals thought that the lack of security in the schools was a major setback for the school. After working so hard to acquire the tools, they would be stolen because of the lack of security in primary schools.

4.5.7. Section summary

The principals interviewed in this study indicated that their lack of experience in ICT may influence in the way ICT is implemented. It was also revealed that the lack of collaboration and support could hinder ICT implementation. Despite the fact that there was a well-structured syllabus for schools, workload, the lack of security and technophobia could be viewed as having a major influence on the implementation of ICT in inclusive primary schools.

4.6 ANALYSIS OF DATA OBTAINED FROM THE OBSERVATIONS

4.6.1 The learning environment

A good inclusive environment should be supported by resources that enhance teaching and learning by learners with diverse needs in the classroom. The resources should be used to create the least restrictive environment possible and reduce barriers to learning. The resources provided should therefore take into consideration the diverse learning needs of learners. The

learning environment in School B was the normal classrooms where everyday lessons took place. The lessons observed in School B were as follows:

During the observation of OB1, each child had his/her braille note touch in School B. There were 57 learners in this class. Through enjoyable learning experiences, the learners develop and use ICT skills in the attainment of the learning objectives as set out in the curriculum. The participant displayed the ability to develop learners' practice and understanding of the safe use of ICT.

OB2 created an exciting atmosphere as the learners enjoyed the lesson even though there were 62 learners in this class. The school did not have sufficient projectors for the learners with partial visual impairment so the participant had to take one from another class when she taught a Grade 6 Mathematics lesson. The whole class used a projector to accommodate learners with visual impairments. The participant sometimes used the chalkboard to provide examples for the entire class as she was teaching. The visually challenged learners were not accommodated in the process.

The learning environment for School A was the computer laboratory which is where both lessons that were observed in School A took place.

OA1 enabled the learners to use ICT to support learning creatively and effectively. There were 55 learners in the class. On average, there were five learners per computer. The computer laboratory was overcrowded and there was not enough space. The learners' backgrounds were very diverse as some had not seen a computer before while others had some prior experience of using a computer. This was evident during the lesson when the participant asked questions about devices and one learner said the following: *"My father does have a computer at home but he does not want us (children) to touch it"*.

OA2 There were 43 learners in the class. The learners were eager to learn using computers. They were in groups of four per computer. Learners' ICT backgrounds were different as some were accustomed to computers while, for others, it was a completely new experience. PA stated that this was because some learners joined the school from neighbouring schools that were not implementing ICT.

4.6.2 Teachers proficiency

On the proficiency level of teachers in the implementation of ICT, data from the observation checklist revealed that there was not sufficient time allocated to ICT lessons. Participants found it extremely difficult to create an inclusive environment in the class. They were not sure of the content and pedagogical tools, especially assistive devices. Participants were confined to what they knew; they did not extend the boundaries of their ICT use as was possible in the wider world. Some of them did not have a chance to use ICT consistently in teaching as it was apparent during class observations that they rarely used ICT. The learners using assistive devices were excluded and further challenged because of their teachers' lack of knowledge.

Some of the participants asked for help when facing a certain difficulty while using available ICT tools and they appeared to become frustrated which could indicate that they were not comfortable to address such situations. Most of the learners did not have prior knowledge of ICT so it required more help from the teacher but time was a major constraint. The participants tried to explain new concepts to the learners but insufficient time allocated for ICT in the school hindered this process.

There was also not enough time for teachers to accommodate all the different needs of learners such as braille and the effective use of projectors to enlarge text for learners. Participants found it challenging to address the needs of autistic learners as they lacked proper training to handle challenging behaviours and the impact on other learners. Some of the ICT tools were in a state of disrepair. Learners did not always have a clear understanding of what was expected from them.

4.6.3 Materials and resource availability

The availability of adequate and well-functioning resources and materials that enhance the learning of all learners in inclusive schools is of cardinal importance. This is mainly because the availability of the materials and resources for inclusion will determine the level of inclusion in the schools.

In School A, the computer laboratory was well furnished but resources were insufficient to accommodate all the learners in one class at the same time. As indicated above, there were 12 computers and in Grade 3 but there was an average of 55 learners whereas in Grade 6, the average number of learners was 43. The large number of learners overwhelmed the teachers. It was observed that it was difficult for teachers to conduct inclusive practices as the sharing of

devices hinders effective learning. The participants grouped learners in groups of 5-7 learners per computers and this made it difficult for the participants to manage and teach effectively using ICT.

In School B, participants used assistive devices to accommodate learners with diverse disabilities and learning difficulties. Each learner had his/ her braille not touch during the lesson. The participants allowed learners who were visually impaired to use other devices such as calculators during the lesson. They used these tools to accommodate all the learners (partially sighted, intellectually challenged and physically disabled). There were not enough computer software jaws and yet all the learners who were visually impaired needed to have this. There was only one electric magnifying machine which was being shared among all the learners. They had sufficient hand magnifying glass devices so the learners were allowed to use these at school and at home.

4.6.4 Pedagogy and content presentation

In School B, the participants were mainly utilising collaborative approaches where they integrated learning through ICT, learning about ICT and learning with ICT. These three are mutually supportive and inter-related (as shown in Figure 4.4). When children are learning about ICT, it has the potential to develop and grow as an inherent part of learning with ICT. Participants in School A were observed during an ICT period. From the lesson observed the participant OA1 had adequate expertise to teach ICT and had been teaching ICT for the past 7 years. The learners indicated that they were not used to the computer laboratory and used it simply to familiarise themselves with ICT tools at school.

It was evident that the computer laboratory was only used for practical work and that most ICT and other lessons are taught in regular classrooms. The learners were excited as they entered the laboratory and used ICT tools in groups of five for Grade 6. ICT was integrated using the complementary approach where ICT tools are used to motivate the learners as a separate subject. Participant OA2 was not confident in the subject matter and found it very challenging to apply the knowledge that each learner is unique and differs in their involvement, behaviours, needs, abilities and in the way they perceive things in and outside the learning environment. In School A, ICT was used to accommodate learners only with partial visual impairments by using a projector to enlarge the words.

In School B teachers were observed in SiSwati (Grade 2) and Mathematics (Grade 6). The findings indicated that the participants observed in this study had adequate levels of experience in the use of assistive devices. They only experienced problems with insufficient time because as OB1 was teaching SiSwati in Grade 2, there was a learner with autism who started disturbing the lesson. The participant left the rest of the class to take the learner to a sensory room to calm down. There were also three learners with visual impairment in the same class.

OB2 was teaching Mathematics in Grade 6 and had experience of teaching learners with disabilities. Despite her experience, time was a great factor as she was accommodating all the learners in her class.

OB2 was teaching long division in Mathematics and there were four visually impaired learners in the class. The other learners were shown and given all the basic steps to follow in long division. The visually impaired learners were allowed to use calculators on their braille note touch instead.

There was a malfunctioning braille note touch device being used by one learner which she tried to repair while the other learners were displaying signs of ill-discipline however she did get assistance from other learners. The other participant (OB1) indicated that he does not have sufficient skills and knowledge as he explained that when he tries to implement ICT for inclusion, time was lost as he needs to help some learners to use assistive devices. This means that the available time was not used effectively to provide maximum access and accommodate learners with diverse disabilities and learning difficulties.

Both participants in School B use the collaborative approach during the implementation of ICT as presented in Figure 4.5. In this approach, participants use learning with ICT and learning about ICT during teaching and learning to accommodate the diverse needs of learners. These findings are in line with Gikundi's (2016) four stages of teachers' deficiencies. Both participants observed in School B were in the applying stage where they enhanced traditional teaching by using ICT. In School A, OA1 was in the infusing stage whereby she was able to understand how and when to use ICT. OA2 was in the emerging stage whereby she was becoming aware of ICT implementation.

Therefore, the stages of teachers' proficiencies and the approach used in the implementation of ICT may influence its implementation.

4.6.5 Organisational factors

As Daniel, Linda and Timothy, (2014) and; UNESCO (2015) argued, some learners with diverse disabilities and learning difficulties would require add-on devices or special peripherals to help them access both assistive technology software and ICT software. This study's findings also support the view that ICT can transform learning in many ways if properly implemented in inclusive primary schools (Hennessy & Onguko, 2010; Kipper, 2012; Meenakshi, 2013; Zielezinski & Darling-Hammond, 2018).

What was observed in the classrooms is that collaboration between teachers and administration is not the only factor required for successful ICT implementation in schools. The teachers asserted that even though they had reported the dysfunctional ICT tools to the administration, it took too much time for these devices to be repaired. An ICT technician is therefore also needed to support teachers. Teachers need to work together as a school with the administration providing full support, including financial support. The lack of trained and skilled individuals in the field of ICT was a major impediment while the demands and pressure on teachers were excessive.

4.6.6 Challenges from class observations

The challenges from the lesson observed were as follows:

It was not possible to accommodate all learners where there are many different kinds of barriers to learning. It was not an easy task for the teacher to accommodate all the learners including those with diverse disabilities and learning difficulties. It can be noted that, as there is an influx of learners in primary schools due to free primary education, it is increasingly challenging for a regular schoolteacher to teach learners with diverse disabilities and learning difficulties without additional support and specialised training. The availability of resources and materials was another challenge because teachers in School A were not able to effectively implement ICT due to the lack of materials. Classrooms were overcrowded and it was not easy to implement ICT to enhance learning. Another challenge observed was the lack of time as the participants did not have sufficient time to support and accommodate all learners within the allocated time.

It was too challenging for teachers to accommodate all the different types of learners in a class and therefore teachers needed professional assistance from a technician and healthcare workers. The lack of resources led to some teachers having negative attitudes. Teachers being

inexperienced in the use of assistive devices also contributed to them having negative attitudes as did the lack of internet connectivity in the schools.

The findings therefore indicated that time constraints and the lack of support staff had a major influence and were a hindrance to the implementation of ICT in inclusive schools.

4.5.7 Section summary

From the lesson observations, it can be deduced that the number of learners in the classrooms overwhelms teachers. The lack of ICT tools, knowledge, time and pedagogies from teachers have an influence on ICT implementation. This was evident during the observations that the lack of resources and support for teachers hinders effective ICT implementation in inclusive primary schools in the Manzini Region.

4.7 CONCLUSION

This chapter discussed the findings from the teachers and principals that was gathered using questionnaires, observations and interviews. Firstly, the chapter discussed the background of the research site and the response rate of the participants. This study was aimed at identifying the factors that influence ICT implementation in inclusive primary schools in the Manzini Region in Eswatini. To answer the main research question, research sub-questions were used to establish what ICT tools were present in the schools, how ICT is taught in an inclusive context, the attitudes and efficiency of teachers implementing ICT. The major challenges indicated by principals and teachers as impediments to ICT implementation were a lack of skills and knowledge, support and collaboration.

Based on the observations from both School A and B, participants were struggling to accommodate diverse needs of learners using ICT. The lack of skills and training for the participants, classes that were overcrowded and the lack of resources were the main contributing factors. The participants' attitudes towards the inclusion of learners with diverse disabilities and learning difficulties was that they must be accommodated in the mainstream but with adequate support from technical and health-care professionals within the schools for effective ICT implementation. The participants raised concerns about the lack of support and cooperation, however, the learners enjoyed ICT irrespective of the approach used by teachers to implement ICT.

The next chapter deals with the discussion of results, summary, conclusion and recommendations for ICT implementation in inclusive primary schools in Eswatini.

CHAPTER 5

DISCUSSION OF RESULTS, SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter contains a discussion of the research findings which are related to the objective investigating the factors influencing ICT implementation in inclusive primary schools in the Manzini Region in Eswatini, I was guided by the four objectives of the study. The findings as presented in Chapter 4 are therefore discussed according to the four research objectives of the study, as outlined below:

- To identify the type of ICT tools available in the schools for effective ICT implementation in inclusive primary schools;
- To explore the attitudes teachers had towards the implementation of ICT in inclusive primary schools
- To examine the proficiency level of teachers who were implementing ICT in inclusive primary mmmschools in the Manzini Region and
- To identify the challenges teachers face when implementing ICT in inclusive primary schools

5.2 TYPES OF ICT TOOLS AVAILABLE FOR INCLUSION IN SCHOOLS

Bhebhe and Maphosa (2016) argued that, in many countries, learners with diverse disabilities and learning difficulties were still not receiving adequate support in schools. This study has found that this is because the use of ICT in addressing the needs of learners with diverse disabilities and learning difficulties has, to date, been poor. This is despite Links (2013) and Tonui et al (2016) suggestions that ICT implementation in education enables flexibility in curriculum development and helps learners with disabilities to participate in the learning experience as equals.

The Annual Education Census (2017) produced by MoET revealed that there are about 8000 learners with diverse disabilities enrolled in the primary school education system every year. MoET (2017) further revealed that most of these learners spend many years at primary level due to grade repetition, insufficient help and the lack of resources.

The education system of Eswatini has to undergo significant reforms in order to align itself with elements of the King's Vision 2022. This study's findings indicate that the type of ICT tools available have fallen short of what was required for the effective implementation of ICT and for the realisation of the objective of attaining inclusive primary schools. This is despite efforts on the part of the participants to utilise the available tools in the schools to enhance teaching and learning. It was also revealed by the participants that the choice of resources should be aimed at meeting the specific learning objective and the diverse needs of learners in the class but the necessary tools were lacking in the schools. As argued by Daniel, Linda and Timothy (2014) and UNESCO (2015) some learners with diverse disabilities and learning difficulties need add-on devices or special peripherals to help them access both assistive technology software and ICT software.

A majority of the participants showed that insufficient learning materials was one of the major impediments of ICT implementation. School A did not have assistive devices, only a computer laboratory that was not used to accommodate learners with diverse disabilities. Teachers were struggling to accommodate the learners with diverse disabilities and learning difficulties present in the school. In School B, teachers used assistive devices such as braille touch notes, scanners, projectors, embossers and hearing aids, among other devices to support learners with diverse disabilities and learning difficulties. There were not sufficient ICT devices in the schools to enhance teaching and learning.

Another hindrance to effective ICT implementation that was cited by the majority of the participants was the lack of timeous maintenance of these tools. The findings indicated that there was no proper planning on the part of both the schools and government for the long-term sustainability of ICT implementation in the schools. As argued by Madzimba et al (2013) long-term financing, among other factors, was the most crucial aspect to be considered for successful ICT implementation in schools. The schools did not have sufficient resources to maintain the tools in the school and the government did not respond promptly to maintenance requests from the schools. In some cases, the teachers were forced to let the learners share devices or try repairing the devices themselves in order to enable the learners to benefit from their use.

5.1 THE ATTITUDES OF TEACHERS TOWARDS ICT IMPLEMENTATION IN INCLUSIVE SCHOOLS

The attitudes of teachers have a significant impact on ICT implementation whether these attitudes are positive or negative. As identified by Shiboko (2015), teachers' attitudes can range from very negative to very positive. This study's findings suggest that technophobia, the lack of time allocated to ICT, the lack of confidence and professional development together with the lack of support and internet connectivity are some of the factors that have a major influence on the attitudes of teachers towards ICT implementation.

Some researchers (Khan et al, 2012; Muriuti, 2016; Tonui et al, 2016) revealed that irrespective of whether teachers have positive or negative attitudes, they both have an influence on ICT implementation in schools. This study therefore revealed that the attitudes of the participants were diverse, ranging from extremely negative to fairly positive. If their attitudes were positive, they had a positive influence but if they had negative attitudes, there would be a negative influence on ICT implementation.

The findings indicated that there are many factors such as positive attitudes towards ICT, the pedagogical approach and prior computer experiences that could positively influence the participants in their innovative use of ICT as suggested by TPACK theory. In addition, teachers' attitudes were identified as a major contributing factor in explaining and predicting the use of ICT by teachers.

The findings also indicated that, of the 15 participants in the study, only five received training and that the lack of confidence resulted to most having negative attitudes. The TPACK theory ascertained that teachers need to be confident in the content, pedagogies and technologies before they can effectively enhance learning using ICTs. Therefore, the five participants who received training had positive attitudes towards ICT and even motivated other teachers to adopt positive attitudes toward ICT implementation. Indicators of teachers' negative attitudes were their inadequate lesson preparation and absence from lessons in order to attend conferences (as indicated by the principals), being occupied with other personal business endeavours such as teaching in private schools and some learners' homes. While there may be several factors that influence ICT implementation in inclusive primary schools, teachers' attitudes and their input are of critical importance.

Another noticeable challenge was the negative attitudes towards learners with diverse disabilities and learning difficulties on the part of teachers. Data gathered from the observations revealed that the participants should be equipped with knowledge and understanding of how to present concepts using TPACK in a constructive way as this could help to minimise some of

the challenges that are faced by learners with diverse disabilities. Some of the participants appeared adamant in resisting change because they did not have the requisite skills.

The study's findings however also indicate that most of the participants saw the advantages and benefits of using ICT to transform the learning process in order to accommodate learners with diverse disabilities in their classrooms. Furthermore, the participants who viewed ICT integration as beneficial, easy to use and who achieved remarkable outcomes in their classrooms had demonstrated a positive attitude. It could therefore be argued that negative attitudes were mainly caused by a lack of knowledge and by the technical problems encountered during ICT implementation which could easily be eradicated by the administrative department of inclusive primary schools in Eswatini. It could also be noted that teachers displayed a willingness to support inclusion using available assistive devices in the schools despite their lack of skills and knowledge.

5.3 THE PROFICIENCY LEVEL OF TEACHERS TO IMPLEMENT ICT IN INCLUSIVE PRIMARY SCHOOLS

This study revealed that the characteristics of participants such as ICT experiences had a major influence on the proficiency levels of teachers as found by Agbo (2015). One of the principals revealed that he had technophobia because he was born "before technology". He called himself a "Born Before Technology" (BBT).

Teacher training was another factor that was cited by most of the participants as one of the major hindrances to ICT implementation in inclusive primary schools. As indicated in table 4, most of the teachers implementing ICT were not trained. This is evident from the Annual Education Census (AEC) Report (2017) which also indicated that there were 170 ICT graduates from the Limkokwin University of Technology. This is the only university of technology in the country.

A majority of the participants expressed that they had content and pedagogical knowledge but were lacking technological skills and knowledge and thus they were not competent for the utilisation ICT for inclusion. The participants were struggling with how ICT could be integrated in teaching and learning. Due to their lack of TPACK a majority of the participants further indicated that they needed professional and technical support for them to successfully implement ICT.

The participants indicated the need to work with professionals to reduce the workload during the teaching and learning process. The participants also stated that the help of health care experts would be greatly appreciated and that would help minimise challenges faced by teachers during teaching and learning such as attending to learners with autism and sensory difficulties. This research also found that there was a lack of support for resources because at some point, parents had to hire therapists to attend to the learners' diverse needs, especially those with diverse disabilities.

The participants also indicated that there was a lack of organisational support in the schools. They suggested the need to work together as a school with the administration in full support. The participants were skeptical of the administration's support for ICT implementation. Teachers also felt that lack of training and skilled individuals in the field of ICT was a significant problem and yet the expectations were high. There was also a problem with dysfunctional ICT tools in the schools. The participants further revealed that the government is not acting promptly to ICT demands in the schools. It was evident from observations that the levels of teacher proficiency was at different stages. Some teachers rarely used ICT during lessons and yet they were eager to have proper training and be exposed to advanced technology in education.

Finding from previous (Gikundi 2016 & Mukhari 2018) indicated that the proficiency levels of teachers should be at the transforming stage in order to implement ICT with confidence. However, based on the proficiency levels of the participants, the researcher can classify them into four stages. The difference may be due to extrinsic and intrinsic factors. The participants in this research were at four stages, namely; transforming, infusing, applying and emerging as suggested by Gikundi (2016). The group of participants in the emerging stage were beginning to be aware of ICT benefits in inclusive education, but lacked TPACK and the confidence to use ICT in the teaching and learning. Teachers who started to use ICT in teaching and learning but who lacked the skills to trouble shoot any problems during the implementation process are classified to be in the applying stage. All participants using the different ICT tools appropriately in teaching and learning and who have the necessary skills are classified to be in the infusion stage. Lastly, participants who are able to draw upon the three unique bodies of knowledge (TPACK) for teaching with ICT are classified to be in the transforming stage. They were able to transform the learning process using pedagogies of modern technologies.

The stages are arranged in their order in the diagram below

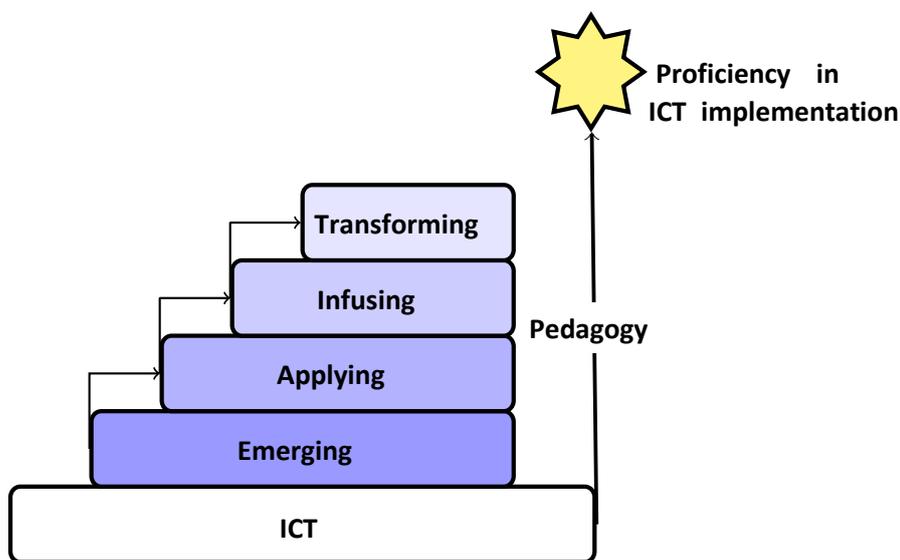
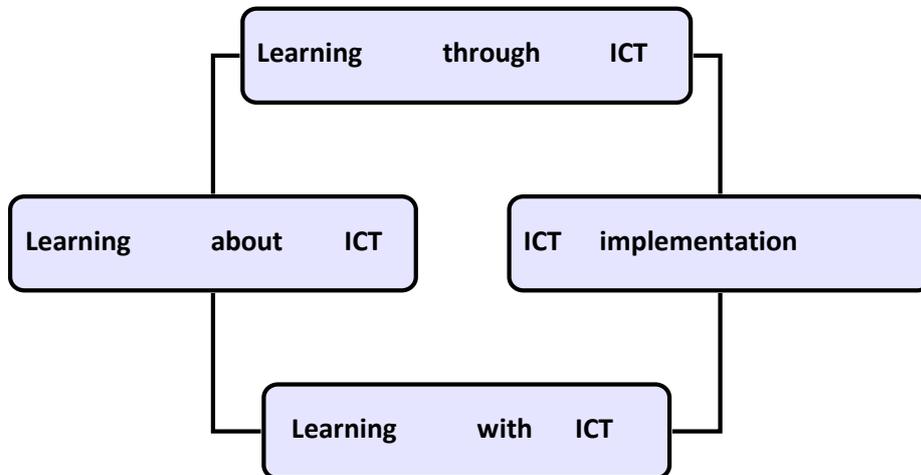


Figure 5.1 Stages in ICT Integration

How teachers implemented ICT was found to be a factor in ICT implementation in schools. Mulinge (2016) indicated that the objective of equal education opportunities for all could only be achieved using an integrated approach. In this approach, learning about ICT was in its introductory phase resulting in a lack of learning with ICT and learning through ICT. The research found that in School A teachers and learners were still learning about ICT and they did not go far beyond that. The learners would go to the computer laboratory to be introduced to ICT and how ICT could be used to enhance learning.

In School B however, they followed Mulinge's (2016) tactical approach. There was an orientation course for learners to be introduced to the different ICTs present in the school. The learners were prepared for learning through ICT and learning with ICT (as presented in Figure 5.2). However, most of these learners who had to undergo these stages were those with diverse disabilities like visually impaired learners. They would then be placed together to learn with their peers in the mainstream. Despite all the efforts made by the school, there was not enough to support for learning through ICT and learning with ICT which then did not result in successful ICT implementation (as indicated in the diagram below).

Figure 5.2 - ICT implementation in schools



5.4 CHALLENGES EXPERIENCED IN ICT IMPLEMENTATION IN INCLUSIVE PRIMARY SCHOOLS

The literature reviewed indicated that challenges and impediments to the implementation of ICT in inclusive primary schools in Eswatini are in line with the findings of many researchers (Mustafina, 2016; Tonui, Kerich & Koross, 2016; Alshmrany & Wilkinson, 2017; Halverson, 2018; Murriithi, 2017; Barakabitze et al, 2019). Eight of the 15 participants in the study (53%) suggested the lack of teacher training as the major challenge to ICT implementation. According to Agbo (2015) teachers need to know and have a deep understanding and knowledge of how best technologies could be used to transmute teaching and learning in inclusive schools. Mishra, Kohler and Henriksen (2014) suggested that teachers be viewed as independent agents with the power to apply the appropriate pedagogies in technology integration (TPACK).

The absence of background in ICT is a factor contributing to the lack of ICT implementation. The findings imply that some of the learners who are doing ICT have little or no background at all in ICT as most of the government schools in Eswatini do not offer ICT, especially rural schools. It was found that learners admitted from other schools were expected to do ICT with no ICT background at all. These learners would have to do a seven-year course in three years. The ICT teacher would then have to combine learners who are at different levels in one class, concentrating on the basics such as the vocabulary and key aspects, before he or she started to

teach ICT. It is clear from the findings that learners need to be introduced to ICT at the first grade level of education and that should be compulsory for all the inclusive primary schools in Eswatini.

The shortage of teachers was cited as another challenge to ICT integration in inclusive schools. There is a common practice by MoET in Eswatini where secondary and high school trained teachers were offered jobs to teach in primary schools and yet they did not have the necessary skills, competencies, and pedagogies to teach primary schools learners. This may result in some learners with diverse disabilities and learning difficulties not doing very well. According to the Annual Education Censures (AEC) Report (2017), learners at the primary stage need professional support because their brains are developing rapidly. Therefore, these barriers are viewed as deprivation to both teachers and learners (Wachiye, 2012; Koech, 2018), especially learners with diverse disabilities and learning difficulties.

The AEC (2017) indicated in their report on SDG4 that all learners should be included in the mainstream schools and be given equal education opportunities. Hence, primary schools in Eswatini admitted some learners with disabilities to be part of the mainstream programme. Surprisingly, it was then the responsibility of schools' management and teachers to ensure that these learners had the relevant materials needed for learning. Moreover, the schools were not yet ready for inclusive education.

Some researchers (SITES, 2015; Eireann, 2015; Tonui, Kerich & Koross, 2016; Koech, 2018) indicated that ICT integration necessitates extensive teacher knowledge (TPACK) on ICTs so that they can effectively accommodate all learners in one class using assistive devices and technologies. The study's findings concur with Tonui, Kerich and Koross (2016) who suggested that training should not only focus on ICT teachers but all teachers in the school as teachers need to keep abreast of the fast changing world of technology. Professional development of teachers remains key for successful ICT implementation in inclusive primary schools. The participants strongly indicated the need to be trained while in-service and this applied not only ICT teachers but to every teacher.

The lack of time is also a contributing factor. According to Agbo (2015), the lack of time is two-fold: release time and scheduled time. Wachiye (2012) revealed in a study conducted that 82% of participants indicated that the lack of release time was a major barrier to ICT use in classes because there was not enough time to practice and prepare for ICT lessons. 80% of teachers indicated that even the lack of scheduled time for ICT was a problem because learners

did not have enough time to practice using ICT. The findings indicated that there was not enough scheduled and release time for ICT in School A. The time was not adequate yet there were high expectation from the ICT programme. The syllabus itself was too vast for the allocated time. In School B, there was not enough scheduled time to cater for all the different learners' needs.

The findings also revealed that the inadequate numbers of ICT teachers, was another factor that was hindering ICT implementation in inclusive primary schools. Schools had five trained teachers while the remainder of the teachers had not received any training. This situation implied that the few ICT teachers were experiencing a great deal of pressure because learners utilising ICT require personal attention, especially as the number of learners in the classrooms also overwhelmed them. If a teacher goes to class tired, his or her effectiveness is reduced. It would be safe to say that the inadequate number of ICT teachers contributes negatively to the implementation of ICT in inclusive schools.

The lack of resources to support teaching and learning was a factor contributing to limited ICT implementation. The participants from both schools indicated that the lack of resources was a challenge despite wanting to use different assistive devices to support and accommodate diverse disabilities. These resources were not provided for by the school and the government. This resulted in learners sharing devices in the school. For instance, they did not have enough braille note touch, projectors, computers and computer laboratories. Schools should be equipped with the necessary teaching and learning materials, and a backup plan should be developed to assist schools to have enough resources to sustain the programme. The lack of teaching and learning material reduces the teacher's effectiveness and consequently makes lessons uninteresting (Bhebhe & Maphosa, 2016). An ineffective teacher and an uninteresting lesson reduces the learners' participation and performance.

It was also found that, for participants, the lack of technical support resulted in the under-utilisation of ICT in the classes. Most of the participants in school A were not using computers because they were not sure where to turn for help when something went wrong while using computers. The principals shared the sentiments of the teachers that the lack of technical support was a problem. The skills needed for some of the tools was far beyond the scope of the teachers'. These findings are in agreement with Gikundi's study (2016) that the lack of technical support for teachers is another factor that influences ICT implementation in schools.

Another contributing factor limiting ICT implementation was the lack of motivation. The issue of motivation, concurs with Simelane (2013) who revealed that, in Eswatini, the factors that had a negative effect on the implementation of ICT in inclusive primary schools was the lack of motivation due to limited school leadership support, the lack of self-motivation and the absence of positive attitudes. Most of the participants indicated that they were not remunerated as specialists but forced to combine ICT with other subjects. Another demotivating issue raised by the teachers was that of large sizes and dysfunctional ICT tools. issue raised. The benefits of ICT implementation were a motivation for the teachers as some indicated that it reduced their workload. The findings are also in line with Bhebhe and Maphosa's (2016) study that contends that teachers needed to be motivated in order for them to teach effectively. Both intrinsic and extrinsic motivation is vital for ICT implementation in inclusive primary schools. He went on to state that attitudes would be positive when teachers were motivated.

Creating an inclusive environment is another factor that hinders ICT implementation in inclusive primary schools. Both schools in the study needed to create inclusive learning environments where all learners are accommodated. There were still barriers that range from infrastructure, class size, pavements, ramps and support for the learners. The schools need to modify physical infrastructure around the schools to ensure inclusivity, especially for learners with diverse disabilities. Most of the teachers indicated that an inclusive classroom is every teacher's "nightmare" because they lack the skills and expertise for inclusive education and that hinders inclusive practices. Despite the call by the MoET education census (2017) and UNICEF-, (2018), all learners with or without disability have to attend the same age-appropriate classes at the local school, with additional, individual tailored support needed (as discussed in Chapter 2).

Collaboration is another external factor that hinders ICT implementation. Teachers perceive collaboration as the collegial interaction, reflection and communication system of the school and internal information sharing. Collaboration can also facilitate change in both teachers and learners in the way they learn or teach using 21st century skills. Teachers thought it was vital for all stakeholders to collaborate for the successful ICT implementation in inclusive schools in Eswatini.

The education of learners with diverse disabilities and learning difficulties is still not adequate in Eswatini. Simelane (2013) revealed that the education of these learners was attached to certain special schools instead of a holistic approach in all schools. Simelane (2013) further

argued that inclusion is a very complex issue which cannot simply be resolved by placing learners with diverse disabilities in ordinary schools. Ultimately it is about creating equal education opportunities for all learners.

5.5 SUMMARY

The research study on the factors influencing ICT implementation in inclusive primary schools, indicates that the issue of ICT implementation does not depend on the absence or availability of one single factor, but a combination of multiple factors. Therefore, there cannot be a single solution to address the impediments to ICT implementation. It is therefore important to acknowledge that teacher training and the availability of resources are the major factors that influence ICT implementation in inclusive primary schools in the Manzini Region in Eswatini. The research further revealed that the approach taken regarding ICT implementation in inclusive primary schools is unstructured, haphazard, uneven and low on the list of priorities.

5.6 CONCLUSION

This chapter has discussed the findings, based on the research objectives. It is worth noting that more could be done by all stakeholders in supporting the implementation of ICT in inclusive primary schools in Eswatini. There are still a number of learners who require agent attention and accommodation in education in terms of the organisation for education. Mission aided schools are championing the provision of education for learners with diverse disabilities and learning difficulties but the government's poor commitment is a major setback to addressing the education of learners' with special needs.

5.7 RECOMMENDATIONS

From the above findings, the following recommendations are offered:

- The government of Eswatini should provide primary schools with long term funding to sustain ICT programmes to ensure equal opportunities for all learners irrespective of their different learning needs. It became evident during the corona virus pandemic in 2020 that the education system should take serious measures towards ICT implementation. The world is evolving towards the 4IR and virtual learning and as such,

ICT should not be used as a desperate measure. The system should prepare all learners to be adequately equipped to participate in this changing world.

- Encourage all primary schools to implement ICT and the utilisation of assistive devices to accommodate learners with diverse disabilities present in schools. As the Minister of Education Mabuza (2019) argued, educators and the whole education system from primary to tertiary level has to rise to meet the demands that come with the 4IR in education because, as greater use is made of ICT, people who do not have access to ICT facilities and equipment will be significantly disadvantaged.
- The schools should also create inclusive environments in and outside the classrooms. This will help boost the esteem of learners with diverse disabilities by making them, - part of the schooling system. The current school environment is a drawback to learners living with disabilities.
- The government should also invest in capacitating and training teachers through in-service courses and recruiting fully trained ICT teachers to ensure maximum ICT usage by teachers in the teaching and learning process.
- The government should provide for an ICT external examination in Grade 7 as in all other subjects because there is a syllabus for ICT in primary schools.
- There should be collaboration between the government, teachers, parents and principal for the successful implementation of ICT.
- Schools should have professional health care workers to help teachers in cases of special health needs that arise in classrooms, such monitoring learners with autism. They should also be responsible for the sensory rooms.
- Each school should have support teams (administrative, pedagogical and technical) to manage any ICT tools and help teachers and learners when they encounter problems with these tools.
- The government, should pay ICT teachers
- All learners in inclusive primary schools should be oriented to the effective use of assistive devices to allow collaboration and cooperative learning between learners irrespective of their physical, mental or psychological challenges. Learners should also

be encouraged to bring ICT tools like tablets and cellphones for use in the classroom when the need arises.

- Government needs to increase the number of teachers for ICT by training or providing in-service training for all inclusive primary school teachers as the number of learners in the classrooms currently overwhelm teachers.

5.8 AREAS FOR FURTHER RESEARCH

Due to the limitations of this study, further research on factors influencing ICT implementation in rural schools of Eswatini from the same region or even in all the four regions needs to be undertaken. Further research could determine why the government is not encouraging all the inclusive primary schools to implement ICT as a means of accommodating differences and working towards inclusion.

5.9 LIMITATIONS OF THE STUDY

This study's findings are limited to the two schools in Manzini Region and the results cannot be generalised to all-the inclusive primary schools in Eswatini because they may have other factors that influence ICT implementation due to their setting. This research was limited because of the of sample size used. The researcher also selected participants with the necessary information needed to respond to questions. Another limitation is that of time that was allocated for interviews because the participants had other commitments.

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APPENDIX A-INTERVIEW SCHEDULE

Interview guide

- What type of ICT tools does your school have?
- Does the school have enough facilities for ICT implementation?
- How do the school maintain the ICT tools?
- What role is ICT playing in your school?
- How do you feel about computer use in your school? Can it be the cause of development differences between those who have computers and those without?
- What can you say about teachers' preparedness in the ICT implementation?
- Do you think the teachers are doing enough to help learners experiencing barriers to learning with the use of ICT,
- What do you think can be done to help teachers implementing ICT?
- How would you describe learners' attitudes towards ICT?
- It is believed that learners enjoy ICT, but not when used to enhance teaching and learning. What is your take on that?
- What can you say about ICT and learning in your school?
- Do you think there are enough policies in place to support the implementation of ICT in inclusive primary schools?
- What are the challenges you face towards the implementation of ICT in your school?

- How do you think some challenges can be eliminated in order for the government and the Ministry of Education and Training (MoET) to successfully implement ICT in all-inclusive primary schools in Swaziland?
- What challenges are teachers experiencing in the implementation of ICT?

APPENDIX B-QUESTIONNAIRES

QUESTIONNAIRES

SECTION A-GENERAL INFORMATION

Mark in the box (X) for relevant gender

MALE

FEMALE

Mark in the box (X) for relevant age bracket

20-30years

31-40 years

41-50 years

51-60 years

Mark in the box (X) with the relevant qualification

Master's Degree

Bachelor's Degree

Primary Teachers Diploma

(PTD)

Other

SECTION B- QUESTIONS

1. How does ICT contribute to your personal experience and development?-----

2. Do you think your schools computing facilities is adequate? If yes how?-----

3. How does ICT tools and related software contribute to your individual program objectives?-----

4. Which teaching and learning areas are you using ICT frequently?-----

5. What specific knowledge, skills and qualities have you developed with ICT and how do these match your program objectives in the school?-----

6. For an inclusive school, how do you enhanced teaching and learning using ICT? -----

7. How do you use ICT to address barriers to learning and development at your school?--

8. How is ICT integrated in your school? -----

9. Does your school have a specific ICT program or curriculum to follow in the integration of ICT?-----

10. In your school rules, do you have some criteria about the use and correct support of digital resources (netbooks, smartphones, tablets, and so on? If yes, give examples.---

11. How your school does the maintenance of the ICT tools and if necessary gets in touch with technical services?-----

12. Can you briefly describe the atmospheres in an ICT classroom?-----

13. Indicate pupils' ratio when you go to the computer lab. Pupils per computer-----

14. Does the school have access to the internet for all computer devices?-----

15. Do teachers have necessary and enough training to manage, at a basic level, with digital school resources and use ICTs in their daily work?

16 Do teachers have enough experience and training in the field of ICT?. If yes how often do teachers receive training or in-service?-----

17 As a teacher, has the use of ICTs in the school make your work easier or has added a lot to your work-----

18 As a teacher, do you include some digital competences criteria amongst the assessment criteria of the subjects you teach ?-----

19 In your opinion, how can ICT be effectively implemented in inclusive primary schools in the country?

20 In your opinion, what factors favourably influence ICT use in the school?

21. Are there any challenges faced by teachers in inclusive schools in the integration of ICT? Name them-----

22. Do you have enough support from the Ministry of Education and Training (MoET) towards ICT integration?

23. Do you have any additions or comments you can give on ICTs in inclusive primary schools? Specify

APPENDIX C-OBSERVATION CHECKLIST

FOCUS AREA	OBSERVATION CHECKLIST	YES	NO	N/A
Learning environment	Do learners remain fully engaged throughout the lesson when using ICT?			
	Do they work effectively together in pairs or groups when using ICT?			
	Are pupils motivated to learn using ICT?			
	Are pupils reliant on the teacher for new skills or ideas when using ICT?			
	Are pupils confident to explore software applications and solve their own problems?			
	Can pupils solve simple ICT problems when they arise?			
	Are pupils encouraged to use online help or reference books when solving ICT problems?			
	Can they organise themselves for working with ICT resources?			

	Do pupils understand what they are doing and how they can improve their work using ICT?			
Material and resources availability	Do pupils have experience of a range of different types of information, including text, numbers, tables, charts, graphs, moving and still pictures, and sounds?			
	Do all pupils experience the same entitlement to ICT?			
	Do displays represent the use of ICT across the school?			
	Do displays represent the range of use of ICT across the school?			
	Do pupils use a range of software applications?			
	Are pupils introduced to different hardware and its uses?			
	Are ICT skills used to support learning in other subjects?			
	Does ICT work show a progressive development of pupils' skills across the school?			
	Are those pupils who use assistive technologies able to use them across the school?			
Pedagogy and content	Does the teacher actively teach new ICT skills or knowledge?			
	Is ICT activity purposeful and meaningful for the age and ability of the pupils?			
	Does the teacher group learners in order to use ICT effectively?			
	Does the teacher use learners own ideas and experiences on ICT?			
	Does the lesson allow the teacher to interact with different groups of pupils using ICT?			

	Do ICT activities and resources meet the differing groups, cultures and backgrounds of learners?			
	Are pupils encouraged to evaluate what they have learned and improve their ICT work?			
	Are pupils encouraged to talk with the teacher and other pupils about their ICT work?			
	Are ICT skills used to support learning in other subject areas?			
Teachers proficiency	Do teachers show a thorough knowledge of the subject content covered in the lesson?			
	Do they show a good understanding of the ICT Programmes of Study?			
	Do they have enough ICT skills to manage the lesson?			
	Can they use hardware and software appropriate to the lesson?			
	Do they use appropriate ICT language and terminology?			
	Can teachers explain new ICT skills and concepts in a way that makes sense to pupils of all abilities?			
	Can they draw on pupils own ICT skills and knowledge when presenting new materials?			
	Do they match ICT equipment and software to interest and challenge pupils			
	Do teachers challenge pupils' thinking about their use of ICT?			
	Are ICT activities stimulating and motivating in order to engage pupils' interest?			

	Are pupils with good ICT skills, gained from access to ICT outside school, challenged?			
	Does the teacher extend the boundaries of the use of ICT in the wider world?			
	Are pupils who make use of assistive technologies suitably challenged?			
Organizational factors	Is time used effectively to promote ICT learning?			
	Is effective use made of ICT resources?			
	Is good use made of any support available (learning assistants, parents etc)?			
	Is time used effectively to provide maximum access to ICT resources?			
	Do ICT resources function reliably?			
	Does the teacher refer pupils to relevant health and safety and acceptable use policies?			
	Are resources deployed and organised effectively for pupils' use?			
	Is the teacher an effective role model for pupils in their use of ICT?			
	Does the teacher provide effective support to all pupils who need it when using ICT?			
	Does the teacher make effective use of time and ICT resources?			
	Do pupils have clear targets about what is expected of them?			

APPENDIX-D

THEMES AND PATTERNS FROM DATA COLLECTION

KEY:

QA1-QA4 : Questionnaires from the ICT teachers in school A

QB1-QB5 : Questionnaires from the ICT teachers in school B

PA : Interview from the principal in school A

PB : Interview with the principal in school B

OA1- OA2: Observation from school A

OB1-OB2: Observation from school B

FINDINGS FROM QUESTIONNAIRES

PARTICIPANTS	RESPONSES	THEMES
QB3	Books are loaded in children's braille note touch so that they may have access to information easily	Assistive devices
QA2	The school use the money collected from parents to fix all problems regarding ICT tools but sometimes we feel the money collected is not enough to cater for all ICT needs in the school.	ICT maintenance ICT funding

QA1	The preparation of resources in primary education should consider the individual learning needs. However, the computer system was not at its best because it was fully dependent on parents support. The government has little or no support at all towards ICT in inclusive primary.	ICT for inclusion Computers Parents support
QA1	If I had another option, I would stop implementing ICT because you become enemy number one with the administration especially when you try to request the money allocated for the subject but have to teach since the pupils need it. If the government can give financial support to all the primary schools implementing ICT maybe it can be better.	Teachers attitudes Collaboration Financial support
QA3	I do not really like teaching that component because it is very demanding and there is not enough material yet one is expected to teach amidst all the challenges. I would	Teacher's attitudes Material availability

	encourage other schools to implement ICT for the benefits of the learners.	
QB1	CT should start with the matter of training teachers and administrators. ICT is now used globally so because of the demand in the outside world, it definitely influences that it be used in all school.	ICT training
QB3	The government should use the schools already implementing ICT as pilot schools so that some problems can be eradicated before encouraging all schools. Teachers specifically trained with assistive devices be employed or in servicing all teachers in the school.	Teachers competencies
QA2	We use ICT for researching and finding learning aids but mainly for communicating	ICT use by teachers
QA3	There is no difference between the methods used to teach ICT and those for other subjects like English and	ICT implementation in schools

	Mathematics. For the ICT learners we are supposed to use the activity-based approach.	
QB5	Help us to get information but increases workload as we try to accommodate learners with diverse disabilities and learning difficulties.	ICT contribution Accommodate diversity
QB3	The administrators (at all levels) do not give us the professional or social support that we need. We do not attend refresher courses in order to keep abreast with the latest teaching techniques. There are no in-house training that have ever been organized at school or district level. ICT teachers have not been sponsored to go further studies. They do not buy the needed material for teaching or learning.	Support for inclusion Lack of ICT training Lack of resources Teaching techniques
QB2	There is a need of enough personal experience and knowledge in assistive devices by all primary school teachers so that we can successfully enhance	Personal experiences

	teaching and learning for all learners even those with diverse disabilities in schools using ICT.	Assistive devices
QA4	All teachers in schools should be part of this program to ease the workload from the ICT trained teacher. There should also be a clear line of communication between all stakeholders to be aligned with what is happening at ground level.	workload Collaboration
QB5	The government should provide with technical support. The role of technical support staff is to monitor and ensure reliability especially concerning technology in classrooms.	Support for inclusion Resource reliability
QB4	Time allocated for lessons is not enough to accommodate learners with diverse disabilities together with the normal learners. This is mainly because some of the devices are not in good conditions and you have to	Lack of time

	keep checking them, so time is lost in that process.	
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Findings from interviews

PARTICIPANTS	RESPONSES	THEMES
PB	ICT is an umbrella word for all the tools and devices that make our lives easier and better such as cellphones, cars, computers, braille, eyeglasses, and wheel chairs just to name a few.	Assistive devices
PB	We had a technical problem with some braille note touch and it took about 2 weeks for a technical support from government to arrive in the school. The problem is that the learners will then be forced to share such tools, which is not effective at all. Sometimes we was forced to hire a technical staff for fixing and repair.	ICT maintenance and support Gadget sharing
PA	Teachers always complaining but we are in this together. I sometimes feel the pressures if some of the devices are not working. The attitudes of teachers are both negative and positive. A majority of teachers has positive attitudes and there those few who have negative attitudes.	Teachers attitudes

PA	There is a clear and laid down curriculum to be followed by schools which starts from the first grade to the last grade (which is grade 7).	ICT program/ curriculum in schools
PB	ICT is good for inclusion because we are able to accommodate all learners irrespective of their learning disabilities because of ICT.	ICT for inclusion Accommodate diversity
PA	I was born before technology so it is not easy to adapt to ICT but I know it's important for inclusion.	Adapting to change

Findings from observation

PARTICIPANTS	RESPONSES	THEMES
OA1	enabled the learners to use ICT to support learning creatively and effectively. There were 55 learners in the class. On average, there were five learners per computer.	ICT use by learners overcrowding
OA2	there were 43 learners in the class. The learners were eager to learn using computers. They were in groups of four per computer.	Material availability Enjoyable learning

OB1	indicated that he does not have sufficient skills and knowledge as he implement ICT for inclusion such that time was lost as the teachers try to help the learner using assistive devices.	Lack of knowledge ICT for inclusion
OB2	was teaching long division in Mathematics and there were four visually impaired learners in the class. The other learners were shown and given all the basic steps followed in long division. The visually impaired learners were allowed use calculators on their braille note touch instead.	Tools used for inclusion
OB1	Through enjoyable learning experiences, the learners do develop and use ICT skills in the attainment of curriculum learning objectives to foster the learners' confidence in their use of ICT.	Learners attitudes Confidence in ICT use

APPENDIX E- ASSENT FROM HEAD TEACHERS

The Head teacher

----- **Primary School**

**P O Box
Mbabane**

Dear Sir/Madam

RE: PERMISSION TO CONDUCT RESEARCH STUDY

I am writing to request permission to conduct a research at your school. I am currently enrolled in Master’s Inclusive Education at the University of South Africa (UNISA) and I am in the process writing my Master’s Thesis. The study is entitled “FACTORS INFLUENCING IMPLEMENTATION OF ICT IN INCLUSIVE SCHOOLS IN MANZINI REGION IN SWAZILAND”.

This study aims to obtain an in-depth understanding of how ICT is integrated, the tools used for the ICT integration, teachers’ proficiency level and the challenges faced by teachers in the implementation of ICT in your school. This study will benefit parents, learners and teachers in the understanding of how ICT can be best integrated to enhance teaching/learning in inclusive primary schools.

I hope that the school administration will allow me to interview the head of the school (interview guide attached) and recruit five teachers both males and females to anonymously complete a nine pages of questionnaires (copy enclosed). Interested teachers was given a consent (copy attached) to sign and return to the researcher.

Your approval to conduct this study was greatly appreciated. I will follow up with a telephone call next week and would be happy to answer any questions or concerns that you may have. You may contact me at my email address thembekileinno@gmail.com or cell number: **76149237** or my supervisor at **+257828654043** or E-mail at **Motitjmc@unisa.ac.za**

If you agree, kindly respond in writing a letter of permission acknowledging your consent and permission for me to conduct this study in your school.

Sincerely

Thembekile I. Simelane

CC: Dr Motitswe, Research Supervisor, UNISA

APPENDIX F- ASSENT FROM TEACHERS

The Teachers

----- **Primary School**

**P O Box
Malkerns**

Dear Sir/Madam

REQUESTING FOR RESPONSE TO QUESTIONNAIRES

I am a student of Masters Inclusive Education in the University of South Africa (UNISA) undertaking a research on the topic “FACTORS INFLUENCING IMPLEMENTATION OF ICT IN INCLUSIVE SCHOOLS IN THE MANZINI REGION OF SWAZILAND”.

This study aims to obtain an in-depth understanding of how ICT is integrated, the tools used for the ICT integration, teachers’ proficiency level and the challenges faced by teachers in the implementation of ICT in your school. This study will benefit parents, learners and teachers in the understanding of how ICT can be best integrated to enhance teaching/learning in inclusive primary schools.

You are kindly requested to assist in providing sincere opinion or response to the questions contained in the questionnaires (see attached). All information provided was treated strictly as confidential and purely for academic purpose.

Looking forward to your favourable response

Sincerely

Thembekile I. Simelane

CC: Dr Motitswe, Research Supervisor, UNISA

APPENDIX G-CONSENT FORM

FACTORS INFLUENCING IMPLEMENTATION OF ICT IN INCLUSIVE SCHOOLS IN THE MANZINI REGION OF SWAZILAND

Consent to take part in research

- I..... voluntarily agree to participate in this research study.
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.
- I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material was deleted.
- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.
- I understand that participation involves responding honest to asked questions.
- I understand that I will not benefit directly from participating in this research.
- I agree to my interview being audio-recorded.
- I understand that all information I provide for this study was treated confidentially.
- I understand that in any report on the results of this research my identity will remain anonymous. This was done by changing my name and disguising any details of my interview which may reveal my identity or the identity of people I speak about.
- I understand that disguised extracts from my interview may be quoted in dissertation, conference presentation, published papers.
- I understand that if I inform the researcher that I or someone else is at risk of harm they may have to report this to the relevant authorities - they will discuss this with me first but may be required to report with or without my permission.
- I understand that signed consent forms and original audio recordings was retained in a secured place with a password and only the researcher has access to data until the exam board confirms the results of this dissertation
- I understand that a transcript of my interview in which all identifying information has been removed was retained for two years from the date of the exam board.

- I understand that under freedom of information legalisation I am entitled to access the information I have provided at any time while it is in storage as specified above.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

For further information, contact the researcher at 76149237 or E-mail at thembekileinno@gmail.com. My supervisor can be contacted at +27124841121 or E-mail at Motitjmc@unisa.ac.za for any comments.

Signature of research participant

Signature of participant

Date

I believe the participant is giving informed consent to participate in this study

Signature of researcher

Date



APPENDIX H-ASSENT FROM THE MINISTRY OF EDUCATION AND TRAINING

The Director
Ministry of Education and Training (MoET)
P O Box 971
Mbabane

Dear Sir/Madam

REQUESTING PERMISSION TO CONDUCT RESEARCH IN TWO SCHOOLS

I write to request permission to conduct research from two schools in the Manzini Region (St Andrews Primary and St Joseph's Primary). I am currently enrolled in Master's Inclusive Education at the University of South Africa (UNISA) and am in the process writing my Master's Thesis. The study is entitled "FACTORS INFLUENCING IMPLEMENTATION OF ICT IN INCLUSIVE SCHOOLS IN THE MANZINI REGION OF SWAZILAND".

This study aims to obtain an in-depth understanding of how ICT is integrated, the tools used for the ICT integration, teachers' proficiency level and the challenges faced by teachers in the implementation of ICT in your school. This study will benefit parents, learners and teachers in the understanding of how ICT can be best integrated to enhance teaching/learning in inclusive primary schools.

The research seek to recruit five teachers from each school (males and females) to respond to questionnaires (see attached) and the principals of the two schools to be interviewed (interview guide attached).the research is expected to take an hour in the school.

The research findings are expected to benefit inclusive primary schools not only in the Manzini region but the whole country and the education system. The research findings were made known to the school and the Ministry of Education and Training (MoET).

Your approval to conduct this study was greatly appreciated. I will follow up with a telephone call next week and would be happy to answer any questions or concerns that you may have. You may contact me at my email address thembekileinno@gmail.com or cell number: 76149237 or my supervisor at +27124841121 or E-mail at Motitjmc@unisa.ac.za

If you agree, kindly respond in writing a letter of permission acknowledging your consent and permission for me to conduct this study in the schools.

Sincerely

Thembekile I. Simelane
UNISA

CC: Dr M. Motitswe, Research Supervisor,

APPENDIX I- ASSENT FROM PARENTS

Dear parent

I am currently enrolled in Master's Inclusive Education at the University of South Africa (UNISA) and I am in the process writing my Master's Thesis. The study is entitled "FACTORS INFLUENCING IMPLEMENTATION OF ICT IN INCLUSIVE SCHOOLS IN MANZINI REGION : SWAZILAND".

One of the course requirements is to complete a classroom observation in an inclusive primary school setting which has implemented ICT in teaching/learning. The observation was done with minimum interference to the regular undertakings in the classrooms.

I appreciate your willingness to accommodate this request. If you have any questions or concerns you may contact the head teacher and the Ministry of Education and Training. I may also be contacted at my email address thembekileinno@gmail.com or cell number: 76149237 or my supervisor at +27124841121 or E-mail at Motitjmc@unisa.ac.za

Sincerely

Thembekile I. Simelane

CC: Dr M. Motitswe, Research Supervisor, UNISA

The Government of the Kingdom of Eswatini



Ministry of Education & Training

Tel: (+268) 2 4042491/5
Fax: (+268) 2 404 3880

P. O. Box 39
Mbabane, ESWATINI

5th November, 2019

Attention:

Head Teacher:

St Andrews Primary School	St Joseph Primary School
---------------------------	--------------------------

THROUGH

Manzini Regional Education Officer

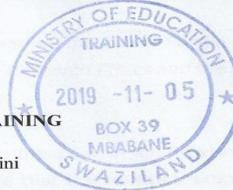
Dear Colleague,

RE: REQUEST FOR PERMISSION TO COLLECT DATA FOR UNIVERSITY OF SOUTH AFRICA (UNISA) STUDENT – MS. THEMBEKILE I. SIMELANE

1. The Ministry of Education and Training has received a request from Mrs. Thembekele I. Simelane, a student at the University of South Africa (UNISA) that in order for her to fulfill her academic requirements at the University she has to collect data (conduct research) and her study or research topic is: "*Factors Influencing Implementation of ICT in Inclusive Schools in Manzini Region in Eswatini*". The population for her study comprises of head teachers and ICT teachers from the two above mentioned schools in the Manzini Region. All details concerning the study are stated in the participants' consent form which will have to be signed by all participants before Ms. Simelane begins her data collection. Please note that parents will have to consent for all the participants below the age of 18 years participating in this study.
2. The Ministry of Education and Training requests your office to assist Ms. Simelane by allowing her to use above mentioned schools in the Manzini region as her research site as well as facilitate her by giving her all the support she needs in her data collection process. Data collection is one month.


DR. N.L. DLAMINI
DIRECTOR OF EDUCATION AND TRAINING

cc: Regional Education Officer – Manzini
Chief Inspector – Primary
2 Head Teacher of the above mentioned school
Dr. Motitswe – Research Supervisor



UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2019/09/11

Ref: **2019/09/11/48093548/08/MC**

Dear Ms Simelane

Name: Ms TI Simelane

Student No.: 48093548

Decision: Ethics Approval from
2019/09/11 to 2022/09/11

Researcher(s): Name: Ms TI Simelane
E-mail address: thembekileinno@gmail.com
Telephone: +26 87 614 9237

Supervisor(s): Name: Dr J Motitswe
E-mail address: Motitjmc@unisa.ac.za
Telephone: +27 12 484 1121

Title of research:

**Factors influencing implementation of ICT in inclusive schools in the Manzini
Region of Eswatini**

Qualification: M. Ed in Inclusive Education

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2019/09/11 to 2022/09/11.

*The **low risk** application was reviewed by the Ethics Review Committee on 2019/09/11 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

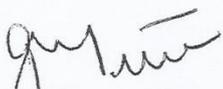
1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.

3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. No field work activities may continue after the expiry date **2022/09/11**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

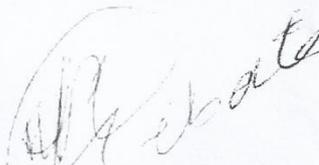
Note:

*The reference number **2019/09/11/48093548/08/MC** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Kind regards,



Prof AT Motlhabane
CHAIRPERSON: CEDU RERC
motlhat@unisa.ac.za



Prof PM Sebate
ACTING EXECUTIVE DEAN
Sebatpm@unisa.ac.za

Approved - decision template – updated 16 Feb 2017

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This serves to certify that the M. Ed (Inclusive Education) Dissertation titled:
**FACTORS INFLUENCING ICT IMPLEMENTATION IN INCLUSIVE PRIMARY
SCHOOLS IN MANZINI REGION: ESWATINI**

by

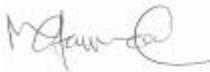
THEMBEKILE INNOCENTIA SIMELANE

was duly edited by me.

I am an experienced editor and have previously edited a range of different publications, including academic journal articles, Research and Annual Reports, Dissertations and books.

Please note that all editing is done in *Track Changes*, and I therefore have no control over what is accepted or rejected by the author. Furthermore, I have no control over text added at a later stage.

Should there be any queries, please contact me on the number provided above.



Margaret Farred
Professional Editor's Guild
Membership Number FA007